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UNIVERSITY OF NEW HAVEN

CATALOG 1971-1972

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UNIVERSITY OF NEW HAVEN

CATALOG 1971-1972
DAY DIVISION

Day Credit Division

Calendar

Summer Session 1971

Registration period	Tuesday-Wednesday	June 1-2
Tuition due on or before	Wednesday	June 2
Classes begin	Monday	June 14
Holiday	Monday	July 5
First term final examinations	Monday	July 19
Second term classes begin	Wednesday	July 21
Second term final examinations	Wednesday	August 25

Fall Semester 1971

*Tuition due—all students	Friday	August 20
Residence charges due	Friday	August 20
Orientation first year students	Monday-Friday	August 30-September 3
Labor Day (holiday)	Monday	September 6
Classes begin	Tuesday	September 7
Last day to add courses	Friday	September 17
Registration for spring—current students	Tuesday-Friday	November 16-19
Thanksgiving (holiday)	Thursday-Friday	November 25-26
Registration for spring—new students		December-January
Classes end	Tuesday	December 14
Final examinations	Wednesday-Wednesday	December 15-22
Last day of semester	Wednesday	December 22

Spring Semester 1972

*Tuition due—all students	Monday	January 3
Residence charges due	Monday	January 3
Orientation, new students	Monday-Tuesday	January 17-18
Classes begin	Thursday	January 20
Last day to add courses	Thursday	February 3
Washington's Birthday	Monday	February 21
Spring vacation	Saturday-Tuesday	March 25-April 4
Classes resume	Wednesday	April 5
Registration for fall—current students	Monday-Friday	April 17-21
Classes end	Friday	May 12
Final examinations	Saturday-Saturday	May 13-20
Last day of semester	Saturday	May 20
Registration for fall—new students		June-August
Commencement	Sunday	June 4

Summer Semester 1972

Registration period	Tuesday-Wednesday	May 30-31
Tuition due on or before	Wednesday	May 31
Classes begin	Monday	June 12
Holiday	Tuesday	July 4
First term final examinations	Monday	July 17
Second term classes begin	Wednesday	July 19
Second term final examinations	Wednesday	August 23

* Students admitted after August 20 (first semester) or January 3 (second semester) must register and pay tuition within ten days of admission and in no case later than the opening day of classes.

History

The University of New Haven is a private, coeducational, independent, urban university, founded by the Y.M.C.A. of New Haven in 1920 as a branch of Northeastern University. The University has held for its primary function service to the individual student as well as to business, industry and institutions of the New Haven area. It has a strong sense of responsibility to the community.

By act of the Connecticut General Assembly, the University was incorporated in 1926 and was authorized to grant the Associate in Science degree. At the same time, an agreement was negotiated with Yale University for the use of classrooms and laboratories for the operation of an evening division. During the years which followed, the University, in cooperation with local business and industry, developed and conducted a systematic educational program.

From 1941 to 1945, the University administered the official Yale University Engineering, Science, Management, and War Training programs for New Haven County. Accreditation of its Associate in Science degree programs in 1948 by the New England Association of Colleges and Secondary Schools marked another significant step forward.

The next decade saw the inauguration of the Reading Center, the Division of Special Studies and the School of Executive Development, now the Management Center. During this period, also, two daytime programs for recent high school graduates were begun. These were in Industrial Administration and Engineering.

Since 1958 the University of New Haven has been authorized by the Connecticut General Assembly to offer courses of study leading to the Bachelor of Science degree to both day and evening students. The acquisition of the present campus in 1960 provided an opportunity for the University to expand its offerings for full-time students and to develop further its other credit and non-credit curricula. In March 1962 the University acquired an additional 28 acres of undeveloped land three blocks north of the present campus, which is the site of new athletic facilities, including playing fields and a new physical education-auditorium building.

In December 1966 the University received accreditation of its Bachelor degree programs by the New England Association of Colleges and Secondary Schools. The attainment of full accreditation, a major step forward, has further helped the University to pursue its principal objectives: to provide leaders and professional personnel within the framework of our democracy, to produce well-educated citizens with an understanding of important cultural and scientific progress, and to encourage students to reach the maximum of their potential.

The year 1969 marked a new educational achievement for the University when it introduced its Graduate School with programs in Business Administration and Engineering. The year 1970-71 saw the increasing growth of the Graduate School, both in enrollment and in programs.

In October 1970 the Board of Governors of New Haven College voted to change the name of the institution to University of New Haven. On October 14, 1970 the State of Connecticut approved the transfer of New Haven College to university status—University of New Haven, Inc.

Divisions of the University

The University of New Haven has four administrative divisions: The Day credit division, the Division of Continuing Education, the Graduate School, and the Management Center. Included in the Division of Continuing Education are the Evening Credit Program, the Extension Credit Programs, the Summer School, the Division of Special Studies, and the Reading Center. All divisions of the University are co-educational.

Undergraduate Credit Programs

Day The degree-granting Day division offers curricula which lead to the four-year Bachelor degree and the two-year Associate degree.

Students pursuing a course of studies leading to a Bachelor of Science degree in Business Administration may elect a major in Accounting, Economics, Finance, General Management, Operations Management (including Computer Concentration), Marketing, Public Administration or Law Enforcement.

Students pursuing a course of studies leading to a Bachelor of Science degree in Engineering may elect a program in Civil, Electrical, Industrial, Materials or Mechanical Engineering.

Students pursuing a course of studies leading to a Bachelor of Arts degree may elect a major in Art, Biology, Chemistry, Economics, English, Environmental Studies, History, Mathematics, Physics, Political Science, or Sociology and Social Services. By taking a modified program in either Chemistry or Physics the student may receive a Bachelor of Science degree. A student may also elect to pursue an interdisciplinary course of study leading to a Bachelor of Arts degree in American Studies.

An Associate in Science degree may be obtained in Business Administration, Engineering, Law Enforcement or Arts and Sciences.

Students pursuing a course of studies leading to an Associate in Science degree in Arts and Sciences may elect a major in General Studies, Commercial and Advertising Art, or Journalism.

Evening The degree-granting Evening Division offers curricula which lead to a Bachelor of Science, a Bachelor of Arts, and an Associate in Science degree.

A Bachelor of Science degree is offered in the following areas: Business Administration with majors in Accounting, Economics, General Management, Operations Management (including Computer Concentration), Marketing, Public Administration and Law Enforcement; Civil Engineering; Electrical Engineering; Industrial Engineering; Materials Engineering; and Mechanical Engineering. Law Enforcement-Administration and Law Enforcement-Science are programs in the Public Administration and Law Enforcement major.

A Bachelor of Arts degree may be obtained in the following majors: Biology, Chemistry, Economics, English, History, Political Science, Psychology, and Sociology and Social Services.

An Associate in Science degree is offered in the following areas: General Studies; General Management; Engineering with a major in General, Electrical, Industrial, Mechanical or Metallurgical Engineering; and Law Enforcement.

For further information regarding the Evening Division, see the *Evening Division Bulletin* which may be obtained at the University or write to the Director of Continuing Education.

The Graduate School

The Graduate School currently offers programs leading to the degrees of Master of Business Administration, Master of Science in Industrial Engineering and Master of Science in Public Administration.

Prospective students seeking detailed statements on any of the above graduate programs and an application blank should write or call: Dean of the Graduate School, University of New Haven, 300 Orange Avenue, West Haven, Conn. 06516, telephone (203) 934-6321, ext. 269.

Division of Special Studies

This Division offers a series of professional certificate courses in engineering, business, and general areas. They are usually designed to provide supplemental knowledge and skills needed in specialized jobs in business and industry, and do not carry academic credit. Further information may be obtained by requesting separate schedules and course folders from the Director of the Division of Special Studies.

Management Center

The purpose of the Management Center is to provide educational opportunities for those managers and administrators in industry, business, and service organizations whose needs are not met in more conventional undergraduate or graduate programs. The overall objective of the Center is to offer programs to help managers of maturity and experience meet the broader and more complex requirements of positions of greater responsibility in their organizations.

Broadly speaking, the programs of the Center are designed to meet the needs of two different levels of management, 1) that of staff and line executives at upper levels, and 2) middle management administrators. At the upper executive level the programs consist of seminars and workshops of varying lengths as needed. At the middle management level the standard format is a part-time on-campus program. Also planned are in-plant programs in which the curriculum will be specifically designed to meet individual company or industry needs. In addition there are special programs available on an ad hoc basis, either on or off campus, as required.

Reading Center

The Reading-Study Skills Laboratory exposes the junior high school, high school, college student and adult to a variety of reading and study materials, techniques, and situations which are programmed to accommodate each individual's needs. A sequence of learning experiences is set up for each individual after a pre-testing and orientation period. Students go

through learning cycles at their own rate programmed by experienced instructors. Informal and standardized tests at the beginning and end of a series of 15 two-and-one-half hour sessions form the basis of a written and oral evaluation of each student. The developmental achievement level of the student determines the range of experiences, skills and materials of instruction, all designed to develop vocabulary power, reading comprehension, speed and necessary study habits and techniques. Electronic devices, auto-instructional materials, programmed books, class lectures, and individual conferences with students and parents are combined to insure the successful progress of each student.

Accreditations and Memberships

The University of New Haven is a coeducational, non-sectarian, independent institution of higher learning chartered by the Legislature of the State of Connecticut and accredited by the Connecticut State Department of Education as a junior and senior college. The University holds membership in the New England Association of Colleges and Secondary Schools, the Association of American Colleges, the Connecticut Conference of Independent Colleges, College Entrance Examining Board, and is also a member of New England and national professional organizations.

The New England Association of Colleges and Secondary Schools accredits schools and colleges in the six New England States. Membership in one of the six regional accrediting associations in the United States' indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary schools meet the standards of membership.

Admission

Since each program of the University has its own admission requirements, these requirements are defined in detail in subsequent pages of this catalog.

In general, graduates of accredited secondary schools are eligible for admission. However, in special cases persons who have not completed their high school education may be admitted to the various divisions of the University of New Haven by meeting certain specified conditions.

In the case of adults, the University is interested in evidence of maturity and motivation as well as in formal education as prerequisites for admission.

With the exception of "auditors," students wishing to take any course, whether or not they seek a degree, must satisfy the admission requirements.

The University of New Haven welcomes the applications of students from all geographic areas, from public or private schools, and from all races, economic levels and religions.

Advanced Placement

The University recognizes the program of Advanced Placement available to talented high school students, operated by the College Entrance Examination Board. Students satisfactorily completing Advanced Placement courses in high school and the final examination prepared by the Educa-

tional Testing Service may be given appropriate college credit if their courses are similar to those offered at the University of New Haven.

Advanced Placement courses are graded from 1 to 5. Credit is allowed where the grade earned is 3, 4 or 5. Credit may be given for a grade of 2, if a careful review of the test by this university determines acceptability. No credit will be allowed for a grade of 1. Students desiring to submit Advanced Placement courses for college credit should have all results of these courses and tests sent in connection with their application to the Admissions Office.

Pre-Professional Programs

In addition to the traditional professions such as law, medicine, public service and the ministry, more and more vocations require that students continue their training after earning the Bachelor degree. Students who wish to begin training for a profession at the graduate level should write to the university they expect to attend and ask for a statement of the entrance requirements. Prescribed programs in the major areas will be modified to meet requirements for entrance into professional programs or to meet the special needs of individual students. Such programs must be approved in writing by the Director of Student Services and by the appropriate department chairman.

Admission of Students Transferring from Other Colleges

Requirements Transfer students may apply to the University of New Haven after successfully completing one or more semesters at an accredited college. Generally speaking, transfer credit will be granted for courses in which the student has obtained a grade of "C" or better in a subject which is similar in content to one given in a major at the University of New Haven or is an acceptable elective.

In accordance with the requirements of a particular department, a student may be required to take an English or a Mathematics examination.

Advanced Standing Transfer credit from other colleges will be officially granted upon the completion of 12 semester hours at the University of New Haven with a satisfactory academic record.

Transfer students who wish to fulfill the requirements for the Bachelor degree or the Associate degree at the University of New Haven must complete the last 30 semester hours of their program at the University of New Haven. Also, for Associate degrees 12 semester hours must be in the field of specialization, and for Bachelor degrees 18 semester hours must be in the field of specialization.

Crediting Examinations

A student who has independent knowledge of the content of an undergraduate course offered by the University may, with the approval of the respective department chairman and dean, take a special crediting examination in lieu of taking the course.

No student may take crediting examinations during the first or last semesters in which he is enrolled. To graduate he must earn at least 30 semester hours through regular course work.

Admission Procedure

1. Write or telephone the University for information and, if you desire, arrange for an interview. Telephone (Area Code 203) 934-6321.
2. Secure an application form from the Admissions Office of the University or from your nigh school guidance counselor.
3. Submit the completed application form with a $10 application fee. This fee is not refundable. (After June, 1971, the application fee is $15.)
4. Request your school to submit a transcript of your secondary school record.
5. Submit College Board test scores (S. A. T.) or University of New Haven test scores.

Registration

Degree and Non-Degree Students There are two parts to registration: the completion of the registration forms and the payment of tuition. Both should be completed before the closing date of registration as stated in the calendar. There is a penalty fee for delaying either of these two processes beyond the closing date of registration.

Registration is possible during office hours on the registration dates stated in the calendar.

New students must register in person at the University office. Currently-enrolled evening students may pre-register by mail. Forms are mailed to the student prior to the announced registration dates. For currently-enrolled day students, registration dates and procedures will be posted in advance.

A separate registration is required for each of the semesters and for the summer session.

Note: Day division students may register for no more than three evening courses. Any waiver of this regulation must be obtained from the cognizant dean.

Changes of Registration and Schedules

Students are urged to plan their programs carefully before completing the registration forms in order to avoid the need for requesting changes. Once the registration is completed, the student is charged the Change of Registration Fee for each change he makes. The fee is payable when the student completes the form requesting the change.

Student Personnel Services

Recognizing the importance of non-academic activities to the development of the student, the University offers a well-rounded program of services and activities designed to make assistance available when needed and to provide outlets for maturing student interests.

Counseling and Health Services The University of New Haven Counseling Center, located in Room 210 of the Main Building, is a non-academic Counseling Center with psychological, academic, medical and religious referrals. Counseling at the Center is offered in such areas as personal, marital, and domestic problems, career development, and vocational and psychological testing. By inquiring at the Counseling Center, a student will be referred to the person most qualified to discuss his problem.

In addition to the Counseling Center personnel, members of the faculty and staff reserve many hours for academic counseling.

Foreign Student Adviser The University is fortunate in having a number of other countries represented on the campus. The Foreign Student Adviser provides special guidance when needed. An International Students Club at the University sponsors activities and trips, and the International Students Center of New Haven welcomes all foreign students to use their facilities and program throughout the year.

Placement Service Requests are often received from students and employers for job placement services. Although the University does not conceive its function to be that of a public employment service, it is interested in and prepared to render placement service within the limitations of its purpose and resources. It acts as a medium of exchange of information between students and former students who desire placement, and employers seeking personnel. It is particularly interested in helping students to find positions which require college study or which lead to positions that require such education, and in assisting students to find employment related to their programs of study.

A student or former student of the University who desires placement should call at the office for a placement application form and at that time will receive specific information as to whom he is to contact in regard to his placement problem.

A company wishing to use the placement facilities of the University should list the job and the desired qualifications in the form of a letter. A member of the University staff will then contact the company to discuss procedure and possibilities of filling the position.

Testing Counselors, upon request, will report and interpret to students the results of their entrance tests.

The Director of Admissions and the Director of Counseling, as professional vocational counselors, are prepared to undertake vocational testing and counseling with students requesting this service.

Student Housing

On-Campus Housing The two-year-old Residence is of modern design containing 16 separate suites. Each suite consists of six double bedrooms opening out to a large living room. Each bedroom contains individual beds, desks, chests and closets. Laundry facilities, snack bar and common lounge are also available in the dormitory. The Residence is co-educational with males assigned to 13 suites and females assigned to three suites.

Applications will be filled in the order received. To be considered, each application for residence must be accompanied by a $100.00 room reservation deposit. The total deposit is refundable if there is no available space. If space is available, $50.00 will become a damage deposit and the remaining $50.00 will be applied toward the room rent.

The University Residence is closed during the Thanksgiving, Christmas and Spring recesses.

Off-Campus Housing Due to the limited number of off-campus apartments and rooms in the immediate area, the University is unable to guarantee off-campus accommodations of your choice.

The University Housing Office will have listings of all University approved housing in the general area. These listings will be available in the Housing Office during the latter half of July.

In entering into an arrangement for private housing, the financial terms should be discussed and implemented by the student himself. The University is of course not responsible for these arrangements, but will make every effort to see that the student is treated fairly.

Cafeteria Two meal plans are available to all students of the University. The 15-meal plan gives the student three meals per day from Monday through Friday. The 20-meal plan offers the student three meals per day Monday through Saturday and two meals on Sunday. The meal plans offer complete, well-balanced meals for a sizeable savings as compared to buying meals for cash.

All dormitory students are required to have a meal plan and it is suggested that all off-campus residents within walking distance of the University participate in one of the two meal plans.

Financial Aid

Well over one-third of the students at the University receive financial assistance annually, in the form of scholarships, grants, loans, bursary work, and the College Work-Study program. Applications by returning students should be made no later than May 1 for the following year, and by new students at the time of acceptance.

Financial aid is not usually available for the summer term or at mid-year. Students needing assistance will ordinarily seek employment during the summer to help defray their expenses for the following year.

Full information and applications for financial aid may be obtained from the Director of Financial Aid.

Academic Scholarships A number of scholarships are awarded each year on the basis of academic achievement, financial need, evidence of self-help, and overall contribution to the University. To be eligible a student must have a cumulative Quality Point Ratio of 3.0 or better and evidence of financial need.

Donor Scholarships Many scholarship awards are available each year through the generosity of business firms, organizations, and friends of the University. The Alumni Association makes scholarship grants to qualified undergraduates.

Amity Charitable Trust Fund
An annual award is made from the income of this fund to worthy students, based on ability, promise, and financial need without regard to sex, race, country of national origin or religion. Preference is given to students whose homes are in the Greater New Haven area.

Asarco-Enthone Scholarship
An award of $1,000 is given annually to a student in the field of Chemistry. The recipient must be a male citizen of the United States or Canada in good health. Selection is based on activities as well as scholarship.

Industrial Management Club of New Haven
Scholarships are available for students attending the University of New Haven. These are administered by the Educational Committee of the Industrial Management Club under the policies established by the Club.

H. B. Ives Company Scholarship Foundation
An annual award of $500 is made to a male undergraduate seeking a degree in engineering, business administration, or management. The recipient must be a resident of New Haven County.

The Martin Luther King, Jr., Memorial Scholarship Fund
Annual awards are available to students entering the University of New Haven who exemplify the ideals of the late Dr. Martin Luther King, Jr. A generous gift from the Guilford Human Relations Council will provide additional awards to New Haven area black students.

The New Haven Chapter of the American Society of Tool Engineers
Annual scholarships to students in mechanical engineering are provided.

The Olin Employees Fund
Full tuition scholarships are offered to sons and daughters of Olin employees meeting the standards of selection.

Virginia M. Parker Scholarship
Established by Chi Kappa Rho sorority, it is awarded annually to a freshman woman selected on the basis of scholarship, potential, and financial need.

Sales and Marketing Executives Club of New Haven
An annual award is open to a superior student in the field of sales and marketing.

Woman's Seamen's Friend Society of Connecticut
Assistance is offered to sons and daughters of merchant seamen of Connecticut and to students preparing for careers in the maritime industry.

Yale University
The scholarship plan for sons and daughters of faculty and staff members of Yale University provides scholarship grants to qualified students.

Grants The University awards a limited number of grants to students who have demonstrated academic promise and financial need, while at the same time contributing substantially to some area of University activity.

Students with extreme needs may qualify for grants of from $200 to $1,000 annually under the Educational Opportunity Grants Program of the Federal government. These grants, matched by other University assistance, are designed to make possible higher education for capable applicants who would otherwise be unable to attend.

Many states and organizations offer scholarships and grants for which UNH students may be eligible. It is suggested that entering students, especially, become aware of any such opportunities for assistance.

Loan Funds

National Defense Student Loans The purpose of this program, established under the National Defense Education Act of 1958, is to make funds available for loans of up to $1,000 annually to needy students with satisfactory academic backgrounds. These loans are repayable starting nine months after graduation at three per cent simple interest. Special forgiving features make this source advantageous to those going into full-time teaching.

United Student Aid Fund This private, non-profit service corporation provides long term, low interest loans to upperclassmen in good standing. Guaranty funds were provided by a donation of the Day Student Council in order for the University to participate.

Guaranteed Loan Programs The State of Connecticut and many other states have established Higher Education Loan Programs offering long term loans at low interest rates. In Connecticut, a student may borrow up to a maximum of $1,500 each school year, repayable starting one year after graduation. If the family's adjusted income is under $15,000 annually, Federal interest benefits cover the full interest while in attendance.

Institute of Electrical and Electronic Engineers

The Connecticut Section of the Institute of Electrical and Electronic Engineers Student Loan Fund offers non-interest bearing loans to senior students in Electrical Engineering.

Additional Loans Loan assistance to students in temporary financial difficulty is available through the Roy M. Jenkins, Jr. Memorial Fund and the University Emergency Loan Fund. Both of these are administered by the Financial Aid Office.

Law Enforcement Assistance Programs

Loans The Omnibus Crime Control and Safe Streets Act of 1968 established the Law Enforcement Student Loan Program which makes available ten year, interest bearing (7%) notes of up to $1,800 per academic year to full-time students enrolled in undergraduate and graduate programs leading to degrees in areas directly related to law enforcement. These loans can be cancelled at the rate of 25% for each year of employment in a public State, Local or Federal law enforcement agency.

Grants Grants are available to full-time employees of a publicly funded law enforcement agency under the Law Enforcement Student Grant Program. Payments up to $300 per semester are provided to full-time or part-time students working toward a degree in this field. A recipient must agree to remain with a law enforcement agency for two years after completion of studies funded by this grant.

Financial need and academic qualifications will be considered in selection of candidates.

Student Employment

College Work-Study Program This federal assistance program is designed to enable students having financial need to work both during the summer and through the school year, thus earning a substantial portion of their college expenses. Work assignments are made on campus and also with non-profit community organizations such as Community Progress, Inc., the YMCA, the West Haven Board of Education, New Haven Urban Corps, and others.

Bursary Work The University provides many jobs on campus for deserving students who may benefit from this type of employment. Awards are made each semester ranging from $275 to $325 for working an average of ten hours a week.

Student Activities

Student Councils Separate Day and Evening student councils have the responsibility for initiating, organizing, and carrying through extra-curricular activities and for performing liaison functions between students and the University staff.

Clubs and Organizations There are almost 40 University student clubs and societies open to interested students. Included are student chapters of professional societies, religious organizations, social groups, and special interest clubs.

Athletic Activities A complete intramural, competitive program is organized and sponsored by the University Physical Education Department. It includes basketball, volleyball, softball, touch football, bowling, golf, tennis, and table tennis. There is also a student-sponsored club football team.

Freshman and varsity intercollegiate athletics schedules include baseball, basketball, golf, hockey, cross country, soccer, and tennis.

In addition to intramural and intercollegiate competition, a planned program of recreation is available.

The University of New Haven is a member of the National Association of Intercollegiate Athletics (NAIA), Eastern College Athletic Conference (ECAC), and the New England College Athletic Conference (NECAC).

Fraternities and Sororities Many national and local service, social, and honorary fraternities and sororities are active on campus. They sponsor programs such as the semi-annual Bloodmobile and other services, as well as social functions.

Publications Student publications include *The News,* the University student newspaper; *The Chariot,* the annual yearbook; and the *Student Handbook.* Any student may volunteer his services on any of the student publications.

Social Activities Starting with the Freshman Picnic and Freshman Week and reaching a climax with the Senior Banquet and Prom in June, the social calendar is filled with informal and formal dances, the Winter Weekend, Homecoming, and several major drama productions. The Evening Division has many social activities of its own, including an annual Christmas party for children, evening receptions, and dances.

The Student Center The Student Center provides a focal point for all student activities. Offering lounges, student offices, a game room, a large cafeteria and a snack bar, the facility has been designed to serve as a center for the student's non-academic college interests.

The proposed student-operated University FM radio station, which will serve the student body and the urban community, will be located in the Student Center.

Special art showings and concerts are presented throughout the year. Seminars planned by students and faculty together are held at frequent intervals. Once a month, the President of the University meets informally with students to discuss all phases of life at the University. The Dean of Students holds weekly Rap-it Transit sessions which are open to all students.

Assemblies Assemblies and lectures are held throughout the academic year; notable speakers are presented at frequent intervals.

Bookstore A most recent addition to the campus, the University bookstore offers new and used text materials, art and engineering supplies, and a large variety of University emblemed gift items.

Student Health Service

Physical Examination Students are required to provide a report of a recent physical examination to the Health Service upon acceptance. Appropriate forms for this purpose are provided.

Infirmary The Infirmary, located in the Residence, is available for emergency first aid treatment and examination for all students, without charge. Day beds are provided for rest and care of mild illnesses for students living in University approved housing. The University Health Staff, under the direction of the Director of Counseling and Health Services, includes the University internists, nurses, psychiatrist and psychologist.

Accident and Health Insurance The University of New Haven Student Insurance Plan is another important service to full-time students and their

families. It was conceived and planned by the Student Council and is designed to help full-time students of the University meet unexpected and very often, costly medical bills arising from an accident or when hospital and medical services are required due to sickness.

The Plan provides protection while the student is at home, at school, or on vacation, 24 hours a day for a full twelve months. Benefits are payable in addition to those the student may receive from any other policy. Details of the Plan are available in a folder sent to all full-time students or from the University nurse.

Library

The Library contains more than 62,000 catalogued volumes in an open-shelf arrangement, with facilites for study and browsing. Subscriptions to approximately 850 periodicals and extensive back-issue files are maintained. There is also a pamphlet file and a rapidly growing microfilm collection. While strongest in the specific areas of study in the University curriculum, the Library's resource materials cover all fields.

The resources of the Free Public Library of New Haven (380,000 volumes) and of the West Haven Public Library (79,000 volumes) are available to all students of the University. For those who are not residents of the respective communities, there is a borrower's charge, although anyone may use without charge materials within the building of these libraries.

Alumni Association

Membership in the Alumni Association is acquired immediately upon graduation from either the associate or the bachelor program. A member of the administrative staff of the University serves as Director of Alumni Relations. An Executive Committee conducts the affairs of the Association during the periods between annual meetings and also serves as a planning group. There is an alumni fund chairman for annual giving.

In addition to the annual meeting, other meetings of social and educational interest occur during the year, and a quarterly publication, the *Alumni News*, is mailed without charge to each alumnus.

The Alumni Association is represented on the Board of Governors by the election of a member to the Board for a term of two years. The president of the Association serves on the Board of Governors as an ex-officio member.

Alumni Advisory Council

Membership on the Alumni Advisory Council is by invitation. Twenty distinguished graduates of the University presently constitute the group. The Council is an advisory board to the University in the conduct of alumni affairs. Its primary objectives are to strengthen alumni relations, advise on matters of top-level policy involving the alumni, improve communications with them, and assist in planning and conducting alumni events. The Council meets quarterly at the University with the President of the University and the Director of Alumni Relations.

Scholastic Regulations

Grading System The following grading system is in use and except where otherwise specified applies both to examinations and to term work. The weight of a final examination grade is a matter individually determined by each instructor.

A Superior
B Good
C Fair
D Lowest passing grade
F Failure

Inc. Incomplete. Indicates that some work remains to be completed. Such work must be made up within six months to remove the "incomplete." Otherwise, the "Inc." remains on the student's record for one semester, after which the "Inc." is changed to "F" and no credit is given for the course.

WD Withdrawal. Indicates either (1) withdrawal prior to the midpoint of semester or (2) withdrawal after the midpoint of semester and work satisfactory at that time.

WF Indicates withdrawal after midpoint of semester with unsatisfactory work. A "WF" is a failing grade.

Students who fail to attend class without officially withdrawing are to be assigned a grade of WF.

S Satisfactory. Given only in non-credit courses.

U Unsatisfactory. Given only in non-credit courses.

Full-time students must complete a minimum of 12 credits per semester to retain their status as full-time students. Completion is defined as receipt of a letter grade (A to F) as opposed to WD, WD/F or Incomplete.

Grade Reports Reports of the final grade in each subject will be mailed to the student soon after the close of each semester. The same report will be mailed to employers in those instances where the student has given his approval. Reports will be mailed to parents or guardians of all students under 21.

Academic Standards The academic standing of each student will be determined on the basis of his quality point ratio each semester.

In order to determine quality point ratios, each letter grade is assigned a quality point value:

A	4 quality points
B	3 quality points
C	2 quality points
D	1 qualtiy point
F	0 quality points
WF	0 quality points

The quality point ratio for all students is obtained by multiplying the quality point value of each grade by the number of semester hours of the course, then dividing the total quality points by the total semester hours.

Students are required to maintain a quality point ratio in accordance with the following scale:

Quality Point Ratio of 1.50 for 3-30 semester hours attempted
of 1.60 for 31-45 semester hours attempted
of 1.70 for 46-60 semester hours attempted
of 1.80 for 61-75 semester hours attempted
of 1.90 for 76-90 semester hours attempted
of 2.00 for 91 or more semester hours attempted

Failure to earn the required quality point ratio will place a student on academic probation for the following semester of enrollment. A student is automatically dismissed when he receives a third probation or when his quality point ratio for any one semester is less than 1.00.

Readmission Application for readmission after a student has been dismissed will be considered only after the lapse of a semester and only when the student provides evidence which indicates his probable success if readmitted.

Requests for readmission should be submitted in writing to the dean of the academic division involved at least three weeks before the opening of the semester and should include evidence supporting the student's belief that he will succeed if readmitted.

Readmission does not automatically follow; each application is decided individually by the Committee on Academic Standing.

Full-time Students Students must complete a minimum of 12 credits per semester to retain their status as full-time students. Completion is defined as receipt of a letter grade (A-F) as opposed to WD, WF or Incomplete.

Dean's List Full-time students who earn a quality point ratio of 3.20 or better in any one semester will be placed on the Dean's List.

All part-time students who have accumulated a minimum of 14 semester hours at the University will automatically be considered for the Dean's List at the end of each semester. A cumulative quality point ratio of 3.20 or better is required.

Requirements for the Degrees

The Bachelor and Associate degrees will be conferred at Commencement when the student has met all the requirements of his program and has met the following University requirements:

1. Has earned a cumulative quality point ratio of at least 2.00.
2. Has been recommended by the faculty.
3. Has met all financial obligations.
4. Has completed the last 30 semester hours at University of New Haven.

Bachelor Degree with Honors

Honors may be conferred upon candidates for graduation who have completed at least 60 semester hours of work at University of New Haven in their junior and senior years. The following standards shall be used:

1. The Bachelor degree *Cum Laude* may be awarded to a student whose cumulative quality point ratio is at least 3.25 at the end of the first semester of his senior year and who continues to attain the same standard for the remainder of the year.

2. The Bachelor degree *Magna Cum Laude* may be awarded to a student whose cumulative quality point ratio is at least 3.50 at the end of the first semester of his senior year, who continues to attain the same standard for the remainder of the year, whose quality point ratio in all courses counting toward his major is at least 3.50, and who has completed all the suggested courses within his curriculum.

3. The Bachelor degree *Summa Cum Laude* may be awarded to a student whose cumulative quality point ratio is at least 3.70 at the end of the first semester of his senior year, who continues to attain the same standard for the remainder of the year, whose quality point ratio in all courses counting toward his major is at least 3.70, and who has completed all the suggested courses within his curriculum.

Advanced Study

Advanced study courses are offered for qualified students in the departments offering the degree of Bachelor of Science or Bachelor of Arts. These courses may include a thesis, tutorial work, or independent study which permits the students to work intensively in areas of special interest.

Associate in Science Degree with Honors

A degree *With Honors* is awarded to students who have a quality point ratio of 3.25 for the semester hours specifically required for the degree program from which they are being graduated, and who have taken all the required work at this university.

Transfer students will be awarded honors on the same basis, with the provision, however, that their total average will be considered only when they have an honor average for studies completed at this university.

A degree *With High Honors* is awarded to students who have a quality point ratio of 3.50 based on the same considerations as noted above.

In determining eligibility for degrees with honors, credits earned by crediting examinations and electives in excess of those required will not be considered.

Transferability of Credit

In accordance with the usual practice among institutions of higher learning, transfer of credit from this university to another institution will be determined by the other institution in terms of the achievement and promise of the individual seeking transfer. The institution to which transfer is being made will also evaluate specific courses in terms of their length and content in relation to its specific requirements. University of New Haven is an accredited institution and its credit will be given consideration by the major institutions of the country in terms of the conditions outlined above.

Course Overload Restriction

A student may not register for a course load in excess of 18 semester hours without prior written approval by his departmental chairman. The chairman, at his discretion, may grant overload approval not exceeding one course if the student's Quality Point Ratio is 2.50.

Attendance Regulations

Classes are operated on the policy that it is necessary for all students to attend all class meetings. If a class is missed, the benefits from participation in the class discussion and instruction are completely lost. No student, regardless of ability, can afford that loss.

Evening Credit Programs A student is allowed only two absences per semester for a 3-or-4 semester hour course. If the student is absent more than twice, permission to continue in the course must be obtained from the instructor.

Day Credit Programs Attendance regulations for daytime students are outlined in the *Student Handbook.*

Coordinated Course Offerings

University of New Haven **Quinnipiac College**

In order to broaden the educational opportunities available to their students, the University of New Haven and Quinnipiac College have entered into a reciprocal agreement through which students formally enrolled in either institution may elect certain courses offered by the other college, subject to the approval of the respective deans.

Credit, grades, and quality points earned in courses covered by this agreement will be officially recorded at the University of New Haven.

The Director of Student Services of the University of New Haven should be consulted for additional information concerning these coordinated course offerings.

Summer Sessions
Day and Evening Credit Divisions

The University offers summer sessions with these primary functions:

1. To offer opportunity for summer study to those residents of the New Haven area who attend other schools during the regular school year. For financial reasons, most of these students find it desirable to live at home and work during the summer. The summer program of the University is offered in both the Day and Evening divisions. Reasons for summer study vary, but are generally confined to the following:
   a. To make up deficiencies.
   b. To satisfy prerequisites for courses in the present institution.
   c. To acquire advanced standing in the parent school.

   In general, credits earned at the University of New Haven are acceptable to parent institutions. For assurance of the acceptance of credit by the parent school, written approval of that school is required. The University of New Haven is a member of the New England Association of Colleges and Secondary Schools and the National Association of Summer Schools.

2. To provide opportunity for summer study to the students of the University. Reasons for summer study for this group of students may be described as follows:
   a. To lighten the study load during the regular school year, but still meet the yearly requirements of the program.
   b. To shorten the normal time required for a degree.
   c. To take preparatory work.
   d. To make up deficiencies caused by failure in certain courses.
   e. To take additional work beyond the degree and yet complete a program within the normal time.

The accomplishment of any one of the five objectives listed above will depend on the specific subjects offered during any summer session.

Registration For all new students a personal interview with a staff member of the University is necessary. Registration procedures will be explained at this time. For those new students who desire work for credit in other institutions, prior approval must be obtained from those institutions (see 1. above). This procedure should be followed each semester regardless of previous attendance.

Transferring of Credits Credits may be transferred from the University of New Haven, a fully accredited university, to any other college or university, merely by obtaining a letter of authorization from the school regularly attended.

Tuition, Fees and Expenses

Guaranteed Tuition Charges

Full-time students (12-18 semester hours or equivalent) entering or re-entering the University of New Haven during the 1971-72 academic year will be charged for each academic year as follows:

1971-72	$1,485 (See note that follows.)
1972-73	1,635
1973-74	1,800
1974-75	See immediately below

Due to prevailing (April 1971) economic uncertainties influencing the expenses of all colleges and universities, public and private alike, it does not seem reasonable or dependable to estimate costs and tuition revenues beyond three years. Determination of 1974-75 tuition charges will be published well in advance of their due date so that students and parents alike can plan sufficiently. The University believes itself to be unique in the projected tuition concept.

The above stated charges for the three-year period are guaranteed for all students who are enrolled in the University of New Haven during the 1971-72 academic year, **provided** each student completes his degree requirements in the normal sequence:

Freshmen	— 4 years
Sophomores	— 3 years
Juniors	— 2 years
Seniors	— 1 year

Any interruption of the above time schedule, regardless of reason, will place the returning student in the schedule of rates published in the catalog of the year during which he returns.

The University will review its financial position during each academic year for the following years and reserves the right to establish a new set of charges for that year's entering students, from one to four years in advance.

NOTE For students who entered the University of New Haven's Day Division prior to or during 1968-69, and who will graduate in June 1972, there will be a special tuition charge of $1,350 for 1971-72.

Day Division, regular academic year 1971-1972

Application Fee	$ 15.00

Payable only once, at time of initial application.
Not refundable.

Acceptance Deposit	35.00

Payable by all new students (incoming freshmen, transfer and former students) upon notification of acceptance. This is a one-time deposit which will be applied toward graduation fee or refunded upon written notice of formal withdrawal.

Tuition	Per semester	Per year
1. Full time students (12-18 hours or equivalent) in day or evening sections*	$742.50	$1,485.00
*Students in engineering required to carry 19 semester hours will pay same tuition by submitting authorization from Dean of Engineering to Business Office.		
2. Less than 12 credit hours in day division per credit hour	$60.00	
3. Less than 12 credit hours in evening division per credit hour	35.00	
4. More than 18 credit hours or equivalent per credit hour—taken in day or evening division	35.00	
Student activity fee	20.00	40.00
Total standard tuition and fees for regular full time students for academic year 1971-1972	$762.50	$1,525.00

Note: The Student activity fee covers subscription to the University newspaper, admission to home athletic events, use of the Student Center, and helps defray cost of student activities and facilities.

Summer Terms and Evening Division

For information regarding both summer sessions and the Evening division request respective brochures.

Other Charges

Change of registration 5.00
Assessed for changing courses or sections after the completion of registration.

Late fee 5.00
Assessed for failure to complete registration and/or payments before due date. All students who have not completed tuition payment by the start of the semester will be assessed an additional late fee of $5.00 plus $1.00 for each additional day thereafter.

Laboratory and Breakage fees—payable each semester by students registering for courses requiring the laboratory fee. See Course Description for specific amounts. Not refundable.

Make-up examination 5.00
Assessed when a student is permitted to take an end-of-semester examination at a time other than the scheduled time, except for conflicts caused by the examination schedule.

Make-up test 3.00
Assessed when a student is permitted to make up an announced test during the semester.

Auditors—The fee for a student auditor in any course or courses is the same as if the courses were taken for credit.

Graduation fee 25.00
Assessed regardless of participation in exercises and due before March 1st of year of graduation.

Transcript of academic work—no charge for the first one; thereafter, per copy 1.00

Residence Charges

	Per semester	Per year
Residence room	$325.00	$ 650.00*

Rooms are contracted for the entire academic year and the student is responsible for the room rent whether or not he occupies the room. The University assumes no responsibility for the loss or destruction of any clothing or personal belongings of the student. The Residence will be officially closed during the Thanksgiving, Christmas and Spring vacation periods when classes are not in session.

Room Deposit $100.00
Payable by all Residence students at the time of application.

Linen	$ 18.00	$ 36.00*
Board		
20 Meal Plan (6 days, 3 meals, Sunday, 2 meals)	$250.00	$ 500.00*
15 Meal Plan (5 days, 3 meals)	$225.00	$ 450.00*

*Residence and board charges are for the academic year September, 1971 - June, 1972, only. Rates are subject to change upon due notification.

Payment of Bills

Tuition, fees, and other charges are payable when due. Payment made by check or money order should be made payable to *University of New Haven.*

As a convenience to those who desire to spread their payments out over a period of time, a deferred educational payment plan is available to full-time students and to part-time students carrying six or more credits or the equivalent. Details of this plan are available at the Business Office.

Failure to Pay

The University withholds the giving of grades, the issuance of transcripts, and the granting of honorable dismissal to any student whose account is in arrears.

Withdrawal—Day Division

From University—Students are required to discuss their intentions with a member of the Counseling Center before officially withdrawing from the University. Forms for withdrawal are available at the Counseling Center.

From a Program—Students considering a change in program should first discuss the matter with the department chairman of the proposed new program. If it is agreed that the change is advisable, written permission will be granted. Forms for making a change are provided by the Reception Office.

Course changes—Forms are available at the Scheduling Office.

Refund of Tuition and Withdrawal from the University

A. **Full-time day students**—Registration does not carry with it the right of an automatic refund of tuition in cases of withdrawal. No deduction is made for temporary absence from classes, nor is any refund made if a student is suspended or dismissed.

Withdrawal from the University—Day Students

Note: Formal withdrawal requires that a student make an appointment with the Counseling Center in order to fill out and sign an official Total Withdrawal form that must be co-signed by a University Counselor.

1. Any student under the age of 21 must have the written consent of a parent or guardian with an indication to whom any refund, if applicable, is to be paid.
2. Tuition is refunded or cancelled according to the scale below upon receipt of formal withdrawal request before the end of the fourth week of a semester.

   1st Week — 80%
   2nd Week — 60%
   3rd Week — 40%
   4th Week — 20%
   After 4th Week — 0
3. In situations involving:
   (a) death or protracted illness of a student
   (b) involuntary induction into military service
   (c) other clearly extenuating circumstances

A pro-rated credit toward the following semester or refund may be awarded, subject to the decision of the Committee on Withdrawals.

All requests for refund must be made in writing and include necessary documentation. The University assumes no responsibility beyond the foregoing for withdrawal occasioned by the pressures of family life or occupation.

The foregoing policy is intended to protect the University, since the University plans its expenses and bases its budget upon full collection of tuition and fees from all registered students, and assumes the obligation of supplying instruction and other services throughout the year.

B. **Part-time students**—Tuition only is refunded or canceled by one of two methods upon receipt of formal withdrawal request before the end of the fourth week of a semester.

1. Percentage basis for any reason during the first four weeks of a semester:
   80% of semester tuition—1st week
   60% of semester tuition—2nd week
   40% of semester tuition—3rd week
   20% of semester tuition—4th week
   0% of semester tuition after 4th week
2. Pro-rata basis of tuition before end of fourth week involving:
(a) death or protracted illness of student
(b) involuntary induction into military service
(c) transfer or change in work initiated by employer that precludes meeting class schedules

All requests for refund must be made in writing and include necessary documentation.

The University assumes no responsibility beyond the foregoing for withdrawal occasioned by the pressure of family life or occupation.

C. **Summer session students**—In cases of withdrawal from a course or courses within the first week of each term, a refund of 50% of tuition only is made. There is no refund of summer tuition after the first week.

The foregoing policy is intended to protect the University, since the University plans its expenses and bases its budget upon full collection of tuition and fees from all registered students, and assumes the obligation of supplying instruction and other services throughout the year.

Changes In Arrangements

The Board of Governors of the University of New Haven reserves the right to make such changes in tuition, fees, and other costs which, in its judgment, are considered necessary and just. No changes in charges will be made retroactive.

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School of Arts and Sciences

John Collinson, Dean

Offering the Degree
Bachelor of Arts with Majors in:

Art
Biology
Chemistry
Economics
English
Environmental Studies
History
Mathematics
Physics
Political Science
Psychology
Sociology and Social Services

Offering the Degree
Associate in Science in
Arts and Sciences with Majors in:

General Studies
Commercial and Advertising Art
Journalism
Biology

Arts & Sciences

Bachelor of Arts

The School of Arts and Sciences offers a four-year college curriculum leading to Bachelor of Arts and Bachelor of Science degrees. Core requirements for all Bachelor programs are listed below. The requirement for graduation is 120-126 semester hours.

Because some employers and some graduate schools in scientific and technical fields indicate a preference for the Bachelor of Science degree, this degree is offered in Chemistry and Biology. If the student wishes to obtain a Bachelor of Science in either major, he may do so by taking a heavier concentration in the sciences. Details of these programs are to be obtained from the department chairmen.

A Bachelor of Arts major in American Studies is offered jointly by the departments of English and History. This program consists of a series of interdepartmental seminars emphasizing various aspects of contemporary American civilization and culture and stresses independent reading and research by the student. For further information contact either the Chairman of the Department of History or the Chairman of the Department of English and Humanities.

Admission Requirements

An applicant for admission to the Arts & Sciences Program must be a graduate of an approved secondary school or the equivalent. While no set program of high school subjects is prescribed, an applicant must meet the standards of the University in respect to the high school average and present 15 acceptable units of satisfactory work, including 9 or more units of college preparatory subjects. Satisfactory scores on College Entrance Examination Board (S.A.T.) or American College Testing Program tests (A.C.T.) are required.

Matriculation for Bachelor Degree Students who have completed at least two semesters or equivalent (30 academic credit hours) with a minimum quality point average of 2.00 may apply for matriculation for the Bachelor degree.

Admission will be limited to applicants who have given evidence of capacity and motivation adequate for upper division work as determined by the department chairman.

Requirements for the Degree

A cumulative quality point ratio of at least 2.00 is required in a Bachelor of Arts student's major field.

Art Study of the vital arts provides opportunity for self-realization and gives the individual a perception of his relationship to society. The program is designed to develop sensitivity to visual materials and experiences and the psychic response to them by which the student will be led to make his

own expressive statement in a variety of media. Many career opportunities exist for those who are competent in the visual arts. Among these are openings for art directors in various fields of business and industry. The program also provides excellent preparation for further study in art education, graphic art, industrial design, architecture, city planning, cinema, television, and art history.

A minimum of 30-36 semester hours in art is required for the major. Flexibility of planning is provided, but it is suggested that the students adhere to the following basic outline of courses: ART 101-102 (Introduction to Studio Art), ART 201 (Drawing and Painting I), History of Art (six semester hours), Design (six semester hours), ART 302 (Advanced Drawing) or ART 313 (Photography), and ART 401-402 (Studio Seminar). Art majors are encouraged to elect courses in art over and above the minimum requirements.

Biology The program prepares the student for medical, dental, veterinary or other professional training, as well as for a graduate program in biology. and in allied health fields. Students in other disciplines, allied or not related, frequently choose biology as a minor area of concentration. This is particularly true for those majoring in the social and behavioral sciences.

For those not seeking specific professional specialization, employment opportunities for biologists are found in industry, federal, state, and municipal organizations, hospitals, research and technical laboratories, as well as in teaching. New employment areas are appearing where a knowledge of biology and a second discipline are required. Examples of these are Bioengineering, Psychobiology, Environmental Science, Pharmaceutical and Biological Sales, Management in Biological Business, Oceanography, Forensic Science, and many more related to biology, such as Pharmacology and Toxicology.

Prospective biology majors or those wishing to follow a Pre-Medical, Pre-Dental, Pre-Veterinary, or allied Health Program should consult with a member of the Biology Department before or soon after registration for their first term.

Prospective biology majors should consult with the department chairman during their first term.

Biology majors are required to take SC 251-252, CH 105-106, M 115-116 or M 117-118, SC 201, SC 301, PH 103-104, SC 261-262, SC 308, SC 307 or SC 309, SC 361-362, SC 491-492, and five elective courses. The language choice in order of preference is German, French, Italian or Spanish.

Chemistry This major is offered for those students who wish to avail themselves of the many career opportunities in the general field of chemistry and also for those who wish to go on to graduate work with a broad liberal education and a thorough grounding in a scientific discipline.

In addition to the regular Chemistry programs, a student may elect options in the following areas: Business, Engineering, Forensic Science, or Pre-Medical. Courses in each option are taken instead of the normal electives. For details of the options, the department chairman should be consulted.

A major in Chemistry must complete the following courses: twelve semester hours of German or Russian or the equivalent, PH 108, 209, 210;

CH 105, 106, 211, 301, 302, 341, 401, 431, 432, 451, 452 or an elective, and one CH 400 series elective. In addition he is required to take Mathematics through M 203.

Economics An economics major within the broad program of liberal studies provides a preparation for higher positions in business and industry today. It is also excellent preparation for graduate work in business administration or for graduate study in economics itself.

Economics majors will be required to take, in addition to EC 133-134 (Principles of Economics I and II), a total of 30 semester hours, including EC 336 (Money and Banking), EC 320 (Mathematical Methods in Economics), EC 340 (Microeconomic Analysis), EC 445 (National Income Analysis and Business Cycles), EC 450 (Thesis). Beyond these requirements, a flexible program may be devised for each major to fit the student's needs and interests. With the approval of the chairman or some other member of the department, a student may elect suitable courses in other departments to fulfill the semester hour requirement. Economics majors are required to take A 111 (Accounting) and are advised to take M 115-116 (Mathematics).

English The study of English as one of the humanistic disciplines offers a solid foundation for graduate work and a liberal education, developing abilities to think critically and write effectively.

The course requirement for English majors is E 113, 206, 211-212, 213-214, and 21 additional semester hours in course work beyond the sophomore level. While no specific courses are required, students will balance their work between period courses and other offerings of the English department. Their major programs must be approved by an adviser who is a member of the English department.

Prerequisites for courses numbered above 300 should include E 113, E 206 and E 211-212. Students not majoring in English who wish to take courses numbered above 300 should have permission of advisers.

Environmental Studies This new Bachelor program offers the student four options in areas of concentration beyond the common group of core courses. These four specialties are: Water Quality Control, Air Quality Control, Community Health, and Community Ecology. The first three are oriented towards the biological and physical sciences, while the fourth is concentrated heavily in the behavioral sciences. Actually this latter specialty is an interdisciplinary program in the behavioral, biological, and physical sciences. There are increasing job opportunities for those trained in the general area of Environmental Studies, as teachers, technicians, administrators, field workers, and as assistants to administrators in business, industry, and government.

A major in one of these areas of Environmental Studies will provide the necessary training to enable the student to continue his education and training in this area by being qualified to enter a professional school related to a specific environmental discipline, such as a school of Public Health or one of Urban Ecology.

Those students interested in one of the optional programs in Environmental Studies should consult with the chairman of the Biology Department.

History The study of history provides excellent preparation for those seeking professional careers in public service and general administration. This major also builds a good foundation for graduate study in various areas, such as law and teaching.

All History majors will be required to take in addition to HS 111-112 and HS 211-212 the following courses: HS 321 (History of Ancient Greece and Rome) or HS 317 (Renaissance and Reformation), HS 231 (Modern Asia). HS 416 (Senior Seminar) is required of all majors. The major program consists of 36 hours to be determined with the advisor.

Mathematics Mathematicians have been in increasing demand in recent years. Consequently the person who has developed mathematical skills will find ample opportunity for employment and for graduate work if he wishes to continue his studies.

A major in mathematics must complete the following courses: M 117, 118, 203, 204, 301, 321, 322, 331, 411, 412. In addition he must complete M 121, 122 and a 300 level mathematics course or, in lieu of those courses, 9 semester hours of mathematics electives approved by the department chairman, plus 12 semester hours of natural science or engineering under advisement.

Physics A major in physics will provide students with basic scientific knowledge for either a technical career or graduate school in any of the sciences and engineering.

A Physics major must complete the following courses: PH 108, 209, 210, 211, 301, 351, 352, 371, 372, 373, 404, and 12 semester hours of Physics electives. In addition he must complete M 117, 118, 203, 204, 301, 331; CH 105, 106; and 12 semester hours, or its equivalent, in German or Russian.

Political Science A Political Science major provides the student with an appropriate foundation for the study of politics or international relations at the graduate level, as well as the study of law, while at the same time it may provide the basis for a career in the electoral process, teaching, communications, the civil service or the foreign service of the United States. All Political Science majors or potential Political Science majors should discuss job objectives and goals with the Department chairman at an early stage in order to select electives with relevance for the total program.

A Political Science major is required to take a total of 27 semester hours in the Political Science Department, which must include PS 121, 122, 401, 402, and PS 416. Comparative European Political Systems (History 221) may be taken by Political Science majors for credit in the 27 hours required for the major. All pre-law Political Science majors should take Introductory Accounting (A 111-112) as an elective and all others should take Statistics for Behavioral Science (Psychology 301) or Statistics (Business Administration 216) as an elective to complete the major.

Psychology Graduate study leading to the Master's degree is minimal for professional status in Psychology. A solid foundation for such graduate work is defined by a broadly-based liberal education.

Major requirements, under advisement, include P 111, P 301, P 321, P 350 and 21 hours of advanced Psychology courses, SC 121-122, SS 113, PHL 111 and one college-level mathematics course.

Sociology and Social Services

Sociology Students who wish to understand the intellectual tradition that has focused on the description and explanation of human society will be interested in a sociology major. It requires a humanistic orientation while regarding empirical research as the major means of extending knowledge about man. A sociology major may continue his work in graduate school or may find employment in such fields as government service, personnel work, advertising, and industry.

Major requirements are SS 113, 114, 221, 413, 440 or 512, P 301 or BA 216 and sociology electives to total 30 hours.

Social Services Students who wish to go directly into Social Work and related areas may take a major concentration in Social Services within the Sociology Department. Courses in this area, where they differ from the Sociology major, are concerned with community problems and their relations to social agencies. Field work and research experience are a part of the curriculum. Employment opportunities in federal, state and private organizations are readily available, or the student may wish to continue his education in a school of graduate studies. The University holds constituent membership in CSWE..

Major requirements are SS 113, 114, 230, 301-302, 400, 501-502, 512; M 127, and P 111, 301, 321 and 336.

Teacher Education The University of New Haven is presently preparing a proposal seeking approval from the State of Connecticut Commission for Higher Education and the Connecticut State Department of Education for an accredited Teacher Education Program. Selected teaching areas will be offered for undergraduate students who can qualify for Teacher Certification and the State of Connecticut Provisional Teaching Certificate. Students interested in a teaching career should meet with the Director, Teacher Education Program, as early as possible in their college career.

Core Requirements for Bachelor Programs

The following course requirements must be fulfilled by all Bachelor of Arts and Bachelor of Science degree students.

Bachelor of Arts

18-30 s.h.	English and Humanities
3	English Composition
3	English Composition and Literature
6	Fine Arts
0-12	°Foreign Language
6	Literature
21 s.h.	Social Studies and Philosophy
6	Economics
6	Western Civilization I & II
3	Philosophy
6	Psychology, Sociology, Political Science
12 s.h.	°°Science and Mathematics: Physics, Chemistry, Science, Biology, Mathematics
n.c.	Physical Education—2 sem.
Total 60 s.h.	

° Competence in the language equivalent to the second semester of the intermediate level.

°° Students are urged to elect a laboratory science. If a student elects the first semester of a double number course in science, he must elect the second semester of that course.

Typical Bachelor Programs — Freshman Year

	Fall			Spring	
E 113	English Composition	3	E 206	English Comp. & Lit.	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
	Foreign Language	3		Foreign Language	3
	Mathematics or Science	3		Mathematics or Science	3
	°Elective	3		°Elective	3
PE 111	Physical Education I	0	PE 112	Physical Education II	0
		15			15

° Choices should be determined by the requirements of the student's major.

Biology SC 251-252, CH 105-106, M 115-116 or M 117-118. Omit HS 111-112 in freshman year.

Economics and History PS 121, SS 113, P 111.

Chemistry M 117, 118, CH 105, 106, German or Russian.

Mathematics M 117, 118, 121, 122, German, French, or Russian.

Physics CH 105, 106, M 117, 118, PH 108, 209, German, French, or Russian. Omit HS 111, 112 in freshman year.

A student will be assigned an adviser in his major area before pre-registration for the first semester of the sophomore year.

Associate in Science

The Arts & Sciences Program offers a two-year college curriculum leading to an Associate in Science degree. Although primarily a terminal program, most courses will transfer upon completion, should the student wish to continue for a bachelor degree.

This program offers a choice of majors to give the students a certain amount of concentration in fields in which it is felt there will be employment opportunities throughout the nation for both men and women. The four majors offered are General Studies, Commercial and Advertising Art, Journalism, and Biology.

General Studies This major is offered for those students who wish a college degree of a general nature and for those students who have not yet decided upon a field of specialization but who, in the meantime, want to start college work.

Commercial and Advertising Art This major is offered for both women and men who wish to obtain employment in a vast and challenging field. All graphic media, such as newspapers, magazines, brochures, company publications and indoor and outdoor advertising displays will be covered. In addition, the courses will help develop the artistic talent of those students who are interested in art training to be used in other professions.

Journalism This major is offered for both women and men who wish to obtain employment in the closely related, and ever expanding, fields of journalism and public relations. Students taking this major will have an opportunity to work on the staff of the University's student publications.

Biology Opportunities for a student majoring in biology are found in industrial, academic and governmental organizations, as well as in research and medical institutions and laboratories. Examples of these would be positions as environmental health and sanitation specialists, medical technologists, medical or scientific secretaries or librarians, cytologists, nurses or nurses' aides, as well as laboratory technicians and researchers in agricultural, biological, and medical laboratories. The greatest opportunities lie in the combined fields of biology and other disciplines such as chemistry, sociology, physics, psychology, engineering, mathematics and business. The most popular of these is the pre-medical or pre-dental program. An A.S. in Biology will allow a student to transfer to a School of Pharmacy with two years of credit toward that degree.

TWO-YEAR ASSOCIATE IN SCIENCE PROGRAM

General Studies Major

First Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
E 113	English Composition	3	E 206	Eng. Comp. & Lit.	3
P 111	Psychology	3	HS 111	Western Civ. I	3
PE 111	Physical Education I	0	SS 113	Sociology	3
PS 121	American Government	3		Foreign Language *or* Elective	3
	Foreign Language *or* Elective	3	PE 112	Physical Education II	0
	*Elective	3		*Elective	3
		15			15

Second Year

	Foreign Language *or* Elective	3	HS 112	Western Civ. II	3
EC 133	Prin. of Economics I	3		Foreign Language *or* Elective	3
	Literature Elective	3	EC 134	Prin. of Economics II	3
	Science *or* Math.	3		Science *or* Math.	3
	*Elective	3		*Elective	3
		15			15

* Students who expect to transfer to a four-year program leading to a Bachelor degree should complete 12 hours of science or mathematics and a foreign language.

The student is expected to carry 15 credit hours per semester. A total of 60 semester hours is required for the degree.

Commercial and Advertising Art Major

First Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
ART 101	Introduction to Studio Art I	3	ART 102	Introduction to Studio Art II	3
ART 211	Design I	3	ART 212	Design II	3
E 113	English Composition	3	E 206	Eng. Comp. & Literature	3
PE 111	Physical Education I	0	P 111	Psychology	3
PS 121	American Government	3	PE 112	Physical Education II	0
	Elective	3		Elective	3
		15			15

Second Year

ART 211	Lettering	3	ART 122	Layout & Print. Tech.	3
BA 107	Advertising & Promotion	3	ART 131	History of Art *or* Elective	3
EC 133	Prin. of Economics I	3	EC 134	Prin. of Economics II	3
	Literature Elective	3		Literature Elective	3
	Science *or* Math.	3		Science *or* Math.	3
		15			15

The student is expected to carry 15 credit hours per semester. A total of 60 semester hours is required for the degree.

Journalism Major

First Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
E 113	English Composition	3	ART 122	Layout & Print. Tech.	3
J 101	Journalism I	3	E 206	Eng. Comp. & Lit.	3
PE 111	Physical Education I	0	J 102	Journalism II	3
PS 121	American Government	3	P 111	Psychology	3
HS 111	Western Civ. I	3	PE 112	Physical Education II	0
	Elective	3	HS 112	Western Civ. II	3
		15			15

Second Year

EC 133	Prin. of Economics I	3	EC 134	Prin. of Economics II	3
J 201	News Writing & Reporting	3	J 301	Advanced Journalism & Feature Writing	3
SS 113	Sociology	3		Literature Elective	3
	Literature Elective	3		Science *or* Math.	3
	Science *or* Math.	3		Elective	3
		15			15

The student is expected to carry 15 credit hours per semester. A total of 60 semester hours is required for the degree. The student majoring in Journalism should be able to type.

Biology Major

First Year

	Fall	Sem. Hrs.	Lab. Hrs.	Class Hrs.		Spring	Sem. Hrs.	Lab. Hrs.	Class Hrs.
E 113	Eng. Comp.	3	0	3	E 206	Eng. Comp. & Lit.	3	0	3
SC 121	Biology I	3	0	3	SC 122	Biology II	3	0	3
SC 131	Biology Lab. I	1	3	0	SC 132	Biol. Lab. II	1	3	0
CH 105	Gen. Chem. I w/Lab.	4	3	3	CH 106	Gen. Chem. II w/Lab.	4	3	3
M 115	Math. Analysis I *or*				M 116	Math. Analysis II *or*			
M 117	Calculus I	3	0	3	M 118	Calculus II	3	0	3
	Foreign Language *or* Non-Science Elective	3	0	3		Foreign Language *or* Non-Science Elective	3	0	3
PE 111	Physical Ed. I	0	0	2	P 112	Physical Ed. II	0	0	2
		17	6	17			17	6	17

Second Year

E 201	World Lit. I	3	0	3	E 202	World Lit. II	3	0	3
SC 251	Zoology w/Lab.	4	3	3	SC 252	Botany w/Lab	4	3	3
SC 361	Biochemistry I w/Lab	4	3	3	SC 362	Biochemistry II w/Lab	4	3	3
SC 201	Genetics	3	0	3	P 111	Psychology *or*			
	*Restricted Elective *or* Foreign Language	3	0	3		*Restricted Elective *or* Foreign Language	3	0	3
		17	6	15			17	6	15

School of Business Administration

Hugh N. Emerson, Dean

Offering the Degree
Bachelor of Science in
Business Administration with Majors in:

- Accounting
- Economics
- Finance
- General Management
- Operations Management
  - Including Computer Concentration
- Marketing
- Public Administration and Law Enforcement, with programs in
  - Public Administration
  - Law Enforcement—Administration
  - Law Enforcement—Science

Offering the Degree
Associate in Science in:

- Business Administration
- Law Enforcement

Business Administration

The School of Business Administration provides programs to prepare students for (1) several areas of business and economics, (2) the broad field of law enforcement, or (3) public administration. The courses of study combine strong professional programs with comprehensive background in the liberal arts.

Business and Economics

The School of Business Administration considers it axiomatic that, over the long run, a graduate is better prepared for the business world when his collegiate business background has been comprehensive rather than highly specialized. Consequently, only a limited amount of specialization is intended in the various departmental majors.

General Management — is the field generally chosen by those students who do not have a particularized objective.

Accounting — is selected by those who wish to make this their career, including possibly ultimate attainment of the Certified Public Accountant license. Accounting has long been recognized as a preferred route to management responsibilities in many fields of business.

Economics — is a broad field in which specialists are called for by industry and government particularly to staff various types of research activities. This major is also one that would be considered by the student contemplating future graduate work or attendance at law school.

Finance — is one of the business disciplines that has extensive application to businesses generally.

Marketing — is a widely recognized phase of business that presents unmatched opportunities to the qualified graduate, depending on whether his interests are in the selling, managing or analytical phases.

Operations Management — is a growing profession. Its practices make increased use of quantitative analysis in the scientific management of business. Students with specific interest in data processing usually select this field.

Programs in Public Administration

Public Administration The Public Administration program is designed to prepare the student for careers in public affairs (government service, politics), governmental research, graduate school, or to give the student an insight, generally, into the various governmental organizations, functions, and methodology which are used to both determine and provide the services to the people.

On the premise that the basic skills required in managerial positions in public service have much in common with those of the manager in private industry, the student follows much the same program as other business students during the first two years.

For his junior and senior years the student majoring in Public Administration will arrange his program under the guidance of his Departmental Chairman, so as to meet his defined objectives. A wide selection of courses is available in the School of Business Administration and the School of Arts and Sciences.

Law Enforcement Four year bachelor degree programs in law enforcement are offered. They are planned for high school graduates interested in any of the many careers in the administration and operation of criminal justice. These may be in state, local, or federal services or in private investigation or security forces. Two programs are offered, Law Enforcement-Administration and Law Enforcement-Science.

Law Enforcement-Administration The supervision of law enforcement is largely concerned with the activities and behavior of people in terms of maintaining law and order, providing needed services, and protecting life and property. The program provides the basic studies in the liberal arts and business administration with the required courses in the administration of law enforcement to prepare the individual for a management career in this field. See the table, Law Enforcement-Administration.

Law Enforcement-Science This program includes strong emphasis on chemistry, mathematics, and physics as well as the forensic laboratory techniques directly related to criminal investigation and identification. The basic liberal arts are included. See the table, Law Enforcement-Science.

Admission

Applicants should be graduates of an approved secondary school with an academic record deemed creditable by this university. A minimum of 15 acceptable units of secondary work, preferably in college preparatory subjects, and with 4 units of English is expected. Satisfactory scores on College Entrance Examination Board Tests or American College Testing Program Tests are required. Non-college credit courses are available to remedy deficiencies.

College transfer applicants will have their official academic transcripts and records evaluated on the general basis that work at an accredited two or four year college or a "C" or better quality will be accepted when a comparable course is offered at this university. Transfer credit is not confirmed until the student has completed successfully one semester at this university. Transfer credit from a two year institution will not be allowed in excess of one half of the semester hours required for graduation here.

Applicants from the Armed Services and other mature individuals are invited to inquire about the possibility of crediting examinations in lieu of certain course work.

Programs

The typical degree programs in the various majors follow. If a student has special interests not provided for by these programs, an endeavor will be made to prepare a specific program for him (e.g. combined programs in Business and Chemistry).

The programs provided in the School of Business are divided into three general categories: (1) the business majors which are presented next below, (2) the programs in law enforcement starting on page 45, and (3) the program in public administration on page 47.

Business

All business students take similar core courses in business, the allied social sciences, and certain other liberal arts subjects. Then several courses are taken in the major business field selected by the student. The program is rounded out with business electives and general college electives.

A student working for an Associate in Science in Business Administration diploma is required to complete the 60 semester hours of prescribed courses of the first two years with an accumulative quality point average of 2.0.

First Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.	
A 111	Introductory Accounting	3	A 112	Introductory Accounting	3	
EC 133	Principles of Economics I	3	EC 134	Principles of Economics II	3	
E 113	English Composition	3	E 206	Composition & Literature	3	
M 127	Finite Mathematics	3	(a)(b)	BA 128 Quantitative Techniques of Management	3	
SS 113	Sociology	3	P 111	Psychology	3	
PE 111	Physical Education	(1)	PE 112	Physical Education	(1)	
	Total	15		Total	15	

Second Year

BA 101	Legal Concepts	3	IE 105	Technical Data Processing	3	
BA 125	Mgmt. & Organization	3	BA 105	Prin. of Marketing	3	
BA 216	Statistics	3	BA 113	Business Finance	3	
PS 121	American Government	3	(e)	E 201 World Literature	3	(d)(e)
SC 111	Physical Science	3	(c)	SC 112 Physical Science	3	
	Total	15		Total	15	

Notes: (a) Subject to placement examination by the Mathematics Department.
(b) M 115 Mathematical Analysis I and M 116 Mathematical Analysis II (or other higher mathematics) may be substituted for the M 127 and BA 128 sequence. Operations Management majors must take the M 115, M 116 sequence (or higher mathematics) only.
(c) or other two semester science courses in Biology, Chemistry, or Physics.
(d) or other advanced English course.
(e) Accounting majors will defer these subjects and take instead A 221-222 Intermediate Accounting.

Before the end of his sophomore year a student will select a business major in consultation with the appropriate chairman or other designated adviser. His degree program for his third and fourth years will be prepared in consultation with his adviser. This will involve the selection of business electives and general electives in addition to the required courses. The term "business elective" means courses listed in Accounting, Business Administration, Economics, Industrial Engineering, Law Enforcement, Mathematics, and Public Administration. "General elective" means all other courses offered by this university.

Courses offered outside of the School of Business Administration or the Industrial Engineering Department of the School of Engineering shall comprise not less than 50 semester hours of all work taken toward graduation. Representative programs follow. A minimum of 120 semester hours is required for graduation.

GENERAL MANAGEMENT

THIRD YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
BA 312	International Business	3	BA 227	Risk & Insurance	3
	Business Elective	3		Business Elective	3
	Business Elective	3		Business Elective	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
E 202	World Literature	3		General Elective	3
	Total	15		Total	15

FOURTH YEAR

BA 231	Industrial Relations	3	BA 229	Financial Management	3
BA 510	Managerial Economics	3	BA 512	Business Seminar	3
	Business Elective	3		Business Elective	3
	General Elective	3		General Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

ACCOUNTING

THIRD YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
A 223	Cost Accounting I	3	A 224	Cost Accounting II	3
E 201	World Literature	3	E 202	World Literature	3
PS 121	American Government	3		Business Elective	3
	General Elective	3		General Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

FOURTH YEAR

A 331	Advanced Accounting I	3	A 332	Advanced Accounting II	3
A 335	Income Tax Procedures I	3	A 336	Income Tax Procedures II	3
A 333	Auditing I	3	A 334	Auditing II	3
BA 510	Managerial Economics	3	BA 512	Business Seminar	3
	General Elective	3		General Elective	3
	Total	15		Total	15

ECONOMICS

Third Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
EC 336	Money & Banking	3	EC 340	Intermediate Economic Analysis	3
	Business Elective	3		Business Elective	3
	Business Elective	3		Business Elective	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
E 202	World Literature	3		General Elective	3
	Total	15		Total	15

Fourth Year

EC 311	Government Regulation of Business	3	EC 350	Economics of Labor Relations	3
BA 510	Managerial Economics	3	BA 512	Business Seminar	3
	Business Elective	3		Business Elective	3
	General Elective	3		General Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

MARKETING

Third Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
BA 107	Advertising & Promotion	3	BA 342	Marketing Research	3
	Business Elective	3		Business Elective	3
	Business Elective	3		Business Elective	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
E 202	World Literature	3		General Elective	3
	Total	15		Total	15

Fourth Year

BA 315	Marketing Management	3	BA 316	Sales Management	3
BA 510	Managerial Economics	3	BA 512	Business Seminar	3
	Business Elective	3		Business Elective	3
	General Elective	3		General Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

OPERATIONS MANAGEMENT

Third Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
IE 233	Cost Control	3	IE 502	Operations Research	3
	Business Elective	3		Business Elective	3
	Business Elective	3		Business Elective	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
E 202	World Literature	3		General Elective	3
	Total	15		Total	15

FOURTH YEAR

IE 507	Systems Analysis	3	IE 234	Production Control	3
BA 510	Managerial Economics	3	BA 512	Seminar	3
	Business Elective	3		Business Elective	3
	General Elective	3		General Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

FINANCE

THIRD YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
EC 336	Money & Banking	3	BA 230	Investments	3
	Business Elective	3		Business Elective	3
	Business Elective	3		Business Elective	3
HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
E 202	World Literature	3		General Elective	3
	Total	15		Total	15

FOURTH YEAR

EC 314	Public Finance	3	BA 229	Financial Management	3
BA 510	Managerial Economics	3	BA 512	Business Seminar	3
A 335	Income Tax Procedures I	3	A 336	Income Tax Procedures II	3
	Business Elective	3		Business Elective	3
	General Elective	3		General Elective	3
	Total	15		Total	15

LAW ENFORCEMENT — ADMINISTRATION

FIRST YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
E 113	English Composition	3	E 206	Eng. Comp. & Literature	3
PA 103	Police Org. & Admin. I	3	PA 104	Police Org. & Admin. II	3
P 111	Psychology	3	SC 122	Biology II	3
SC 121	Biology I	3	SC 132	Biology Lab	1
SC 131	Biology Lab	1	SS 113	Sociology	3
M 127	Finite Math	3	BA 128	Quan. Tech. in Mgmt.	3
PE 111	Physical Education I	0	PE 112	Physical Education II	0
	Total	16		Total	16

SECOND YEAR

PA 106	Police Supervision	3	PA 201	Intro. to Forensic Science	3
PA 215	Prin. of Investigation	3	PA 218	Amer. Legal System II	3
PA 217	American Legal System I	3	PA 221	Juvenile Delinquency	3
PS 121	American Government	3	PS 122	State & Local Govt.	3
A 111	Intro. Accounting I	3	A 112	Intro. Accounting II	3
	Total	15		Total	15

Third Year

EC 133	Economics I	3	EC 314	Public Finance	3
P 336	Abnormal Psychology	3	IE 105	Tech. Data Process.	3
PA 311	Criminology	3	PHL 124	Logic & Scientific Meth.	3
PS 302	U. S. Constitution	3	SA 211	Prin. of Public Admin.	3
	Elective	3		Elective	3
	Total	15		Total	15

Fourth Year

IE 507	Systems Analysis	3	PA 401	Police Prob. Seminar	3
PS 216	Municipal Govt.	3	PA 402	Police-Community Rel.	3
SS 400	Minority Group Relations	3		Electives	6
SS 410	Urban Sociology	3		*Internship OR Elective	3
	Elective	3			
	Total	15		Total	15

* Internship is only for students who have had no practical experience in Law Enforcement.

Total required for the Bachelor of Science degree — 122 semester hours.

LAW ENFORCEMENT — SCIENCE

First Year

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
E 113	English Composition	3	E 206	Eng. Comp. & Lit.	3
PA 103	Police Organ. & Admin. I	3	PA 104	Police Org. & Admin. II	3
PS 121	American Govt.	3	PS 122	State & Local Govt.	3
SC 121	Biology I	3	SC 122	Biology II	3
SC 131	Biology Lab	1	SC 132	Biology Lab	1
	Elective	3		Elective	3
PE 111	Physical Education I	0	PE 112	Physical Education II	0
	Total	16		Total	16

Second Year

CH 105	Gen. Chemistry I	3	CH 106	Gen. Chemistry II	3
	Chemistry Lab	1		Chemistry Lab	1
M 115	Math Analysis I	3	M 116	Math Analysis II	3
P 111	Psychology	3	PA 218	Amer. Legal System II	3
PA 106	Police Supervision	3	SS 113	Sociology	3
PA 217	Amer. Legal System I	3		Elective	3
	Total	16		Total	16

Third Year

P 336	Abnormal Psychology	3	IE 105	Tech. Data Processing	3
PA 215	Prin. of Investigation	3	PH 103	General Physics I	3
PA 221	Juvenile Delinquency	3	PA 311	Criminology	3
PH 104	Gen. Physics I with Lab.	3	PH 104	General Physics II	3
	Elective	3	PHL 124	Logic & Scientific Method	3
	Total	15		Total	15

FOURTH YEAR

IE 507	Systems Analysis	3	PA 304	Forensic Lab II	3
PA 303	Forensic Lab. I	3	PA 401	Police Problems Seminar	3
PS 302	U. S. Constitution	3	PA 402	Police-Com. Relations	3
SS 410	Urban Sociology	3		*Internship OR Elective	3
	Elective	3		Elective	3
	Total	15		Total	15

* Internship is only for students who have had no practical experience in Law Enforcement.

Total required for the Bachelor of Science degree — 124 semester hours.

Associate Degree Program Successful completion of the first two years of the Law Enforcement Program-Administration with a minimum quality point average of 2.00 qualifies the student for the Associate in Science in Law Enforcement.

PUBLIC ADMINISTRATION

FIRST YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
A 111	Introductory Accounting	3	A 112	Introductory Accounting	3
EC 133	Principles of Economics I	3	EC 134	Prin. of Economics II	3
E 113	English Composition	3	E 206	Composition & Literature	3
M 127	Finite Math	3	BA 128	Quan. Tech. in Mgmt.	3
SS 113	Sociology	3	P 111	Psychology	3
PE 111	Physical Education	(1)	PE 112	Physical Education	(1)
	Total	15		Total	15

SECOND YEAR

BA 101	Legal Concepts	3	IE 105	Tech. Data Processing	3
BA 125	Mgmt. & Organization	3	SA 211	Principles of Pub. Admin	3
BA 216	Statistics	3	PS 122	State & Local Govt.	3
PS 121	American Government	3		General Elective	3
SC 111	Physical Science I	3	SC 112	Physical Science II	3
	Total	15		Total	15

THIRD YEAR

HS 111	Western Civilization I	3	HS 112	Western Civilization II	3
PS 304	Political Parties	3	PS 216	Municipal Government	3
EC 314	Public Finance	3	PS 308	Legislative Process	3
	General Elective	3		Courses in major area	3
	General Elective	3		General Elective	3
	Total	15		Total	15

FOURTH YEAR

PS 304	U. S. Constitution	3	BA 512	Seminar	3
PS 407	Political Theory	3		Courses in major area	9
	Personnel in Pub. Service	3		General Elective	3
	Procedures & Tech. in Public Admin.	3		Total	15
	General Elective	3			
	Total	15			

School of Engineering

Thomas C. Warner, Jr., Dean

Offering the Degree Bachelor of Science in:

Civil Engineering
Electrical Engineering
Industrial Engineering
Materials Engineering
Mechanical Engineering

Offering the Degree Associate in Science in:

Engineering

School of Engineering

Admission Requirements

An applicant for admission to the Engineering Programs should be a graduate of a secondary school of approved standing and should present 15 acceptable units of secondary school work. These should include 4 units of English, 2 units of algebra, 1 of plane geometry, ½ of trigonometry, and 1 unit each of physics and a second science.

Deficiencies in English, mathematics, and/or science may be satisfied by summer school attendance, or by an extension of the stated curriculum for one or two semesters chosen to fit the student's need.

Satisfactory placement in tests covering scholastic aptitude, mathematics, and English, as given by the College Entrance Examination Board (S.A.T.) or American College Testing Program (A.C.T.) is required.

Matriculation for Bachelor's Degree Students who have completed at least two semesters or equivalent (30 academic credit hours) with a minimum quality point average of 2.00 may apply for matriculation for the Bachelor's degree.

Admission will be limited to applicants who have given evidence of capacity and motivation adequate for upper division work as determined by the chairman of the department.

A cumulative quality point ratio of at least 2.00 is required in a Bachelor of Science student's major field.

Civil Engineering Bachelor of Science Program: The oldest of all branches of engineering, Civil Engineering is one of the newer Bachelor of Science programs at the University of New Haven. The continued rapid growth of the nation's and the world's economies requires the expenditure of billions of dollars annually for the design and construction of new facilities for commercial, industrial, institutional, and residential buildings, transportation systems of all types, water supply, and sanitary engineering projects. A major area for future development is pollution control of all types; Civil Engineers will play an important role in this field. The student is exposed to these and other areas and, upon the completion of the prescribed four-year curriculum, receives the Bachelor of Science degree in Civil Engineering.

Electrical Engineering Bachelor of Science Program: This program is planned to give students a sound foundation for a professional career in the utilization of electricity in the modern industrial world and in the fields of experimental science and technology. The training includes not only mathematics, mechanics, physics and chemistry, but also economics and other liberal arts subjects. The student becomes familiar with the calculation of circuits of electric, magnetic and dielectric types, theory of generators, motors, magnets and other apparatus, electrical transmission of energy, automation, semiconductors, electronic computers, information theory, microwaves, and related subjects. A great future is open in research in varied areas including the concentrated application of engineering principles to

improved productivity and reduction in human drudgery. Upon satisfactory completion of the prescribed four year curriculum, graduating students receive the Bachelor of Science degree in Electrical Engineering.

Industrial Engineering Bachelor of Science Program: The study of Industrial Engineering prepares a student for a successful career in the manufacturing, research and service industries. Based as it is on a broad engineering background, the professional program taken in the last two years offers a perspective which enables the graduate to cope with complex problem situations encountered in modern industry. Special attention is given to preparing the student for the intelligent use of computers in modern industrial practice. Upon satisfactory completion of the prescribed four-year curriculum, graduates will receive the Bachelor of Science degree in Industrial Engineering.

Materials Engineering Bachelor of Science Program: Materials science, once considered the scientific study of metals, ceramics, plastics, and concrete, now encompasses the study of matter itself, from nuclear particles to structural strength. Practically every product, tool, machine or building is constructed with careful attention paid to the materials from which it is made. An overloaded bridge may collapse with heavy loss of life. Concrete must withstand years of heat and extreme cold. Plastics change dramatically with temperature. Rubber compounds support every automobile occupant, often making the difference between life and death on today's highways. Metal parts must withstand heat, tension, compression, and fatigue. Their design and fabrication are critical processes. Materials scientists are therefore respected experts whose decisions on quality, safety factors, and materials selection are of vital concern to airlines, government laboratories, steel mills, tire manufacturers, and atomic energy installations.

Mechanical Engineering Bachelor of Science Program: The tremendously broad field of Mechanical Engineering requires a common core of fundamental knowledge which is obtained in the required courses in this major. Upon the completion of these required courses, the student, in consultation with his faculty adviser, selects restricted electives which will give him advanced courses in his area of greatest interest. Some of these areas are shown following the B.S.M.E. Program description. Upon satisfactory completion of the prescribed four-year curriculum, graduates will receive the Bachelor of Science degree in Mechanical Engineering.

Associate in Science This program provides students with the first two years of a standard four-year engineering program. Since the University of New Haven courses are fully accredited, the student will be in a position to transfer with advanced standing to the four-year Bachelor program, to the Evening Credit Division of the University, or to another institution. Upon satisfactory completion of the prescribed two-year curriculum, graduates will receive the Associate in Science degree.

ASSOCIATE IN SCIENCE PROGRAMS

(Core Requirements for all majors—BS and AS)

First Year

	Fall	*Sem. Hrs.*	*Lab. Hrs.*	*Class Hrs.*
E 113	English Composition	3	0	3
[1]M 117s	Calculus I	6	2	6
	or M 117 Calculus I	3	2	3
IE 102	Intro. to the Computer	3	0	3
[2]CH 103	Intro. to General Chemistry w/Lab.	3	3	2
[3]HS 111	Western Civilization I	3	0	3
PE 111	Physical Education I	0	0	2
		15-18	5	16-19

	Spring	*Sem. Hrs.*	*Lab. Hrs.*	*Class Hrs.*
E 201	World Literature I	3	0	3
[3]HS 112	Western Civilization II	3	0	3
[4]M 118	Calculus II	4	0	4
CH 105	Chemistry w/Lab.	4	3	3
PH 108	Physics I	3	3	2
PE 112	Physical Education II	0	0	2
		17	6	17

Second Year

	Fall	*Sem. Hrs.*	*Lab. Hrs.*	*Class Hrs.*
M 203	Calculus III	4	0	4
PH 209	Physics II	3	3	2
CE 201	Statics	3	0	3
E 202	World Literature II	3	0	3
EE 223	Principles of Electrical Engineering I	3	0	3
EC 133	Principles of Economics I	3	0	3
		19	3	18

	Spring	*Sem. Hrs.*	*Lab. Hrs.*	*Class Hrs.*
[5] M 204	Differential Equations	4	0	4
PH 210	Physics III	3	3	2
CE 202	Mechanics of Materials I	3	3	2
ME 204	Dynamics	3	0	3
EE 224	Principles of Electrical Engineering II	3	0	3
IE 204	Engineering Economics	3	0	3
		19	6	17

[1] Students will take Course M 117 or M 117s based on results of placement test in mathematics.

[2] Students who are qualified may omit CH 103.

[3] Students may substitute two semesters from another General Studies area, such as Psychology, Philosophy, Sociology, Political Science, etc.

[4] Transfer students taking mathematics course M 137 will omit courses M 117 and M 118.

[5] Industrial Engineering majors may substitute M 331.

TOTAL — Associate in Science Degree in Engineering: 67 to 73 Semester Hours.

BACHELOR OF SCIENCE PROGRAMS

CIVIL ENGINEERING

THIRD YEAR

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
CE 301	Transportation Engineering	3	CE 302	Building Construction	3
CE 307	Mechanics of Materials II	3	CE 303	Steel Design and Construction	3
ME 301	Thermodynamics I	3	CE 304	Soil Mechanics	3
	Elective, General Studies	3	CE 306	Hydraulics	3
	Elective, Restricted	3		Elective, General Studies	3
	Total	15		Elective, Restricted	2
				Total	17

FOURTH YEAR

CE 314	Concrete Design and Construction	3	CE 501	Design Project	3
CE 407	Contracts and Specifications	3		Elective, Free	3
	Elective, Free	3		Electives, Restricted	9
	Electives, Restricted	8		Total	15
	Total	17			

Selection of Electives

Each student will meet with the Chairman of the Civil Engineering Department during the Spring semester of his second year in order to select the restricted electives which will, together with the required courses, result in a program of maximum benefit to the student.

TOTAL — Bachelor of Science Degree in Civil Engineering: 131 Semester Hours Minimum

ELECTRICAL ENGINEERING

THIRD YEAR

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
EE 331	Network Analysis I	3	EE 332	Network Analysis II	3
EE 343	Electrical Machines I	3	EE 348	Electronic Devices and Circuits II	3
EE 347	Electronic Devices and Circuits I	3	EE 351	Elec. System Analysis I	3
EE 349	Elec. Engineering Lab I	2	EE 353	Elec. Engineering Lab II	2
EE 355	Switching & Logical Design I	3		Electives, Restricted	6
	Math Elective	3		Total	17
	Total	17			

FOURTH YEAR

EE 461	Electromagnetic Theory	3	Elective, Free	3
	Elective, Free	3	Electives, Restricted	9
	Electives, Restricted	6	Elective, General Studies	3
	Elective, General Studies	3	Total	15
	Total	15		

Selection of Electives

Restricted Electives shall be from Engineering or Science and are to be chosen in consultation with department members and must be approved by the Chairman of the Department of Electrical Engineering.

TOTAL — Bachelor of Science Degree in Electrical Engineering: 131 Semester Hours Minimum

INDUSTRIAL ENGINEERING

Third Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
IE 214	Management Theory	3	A 113	Industrial Accounting	3
IE 243	Work Analysis	3	IE 234	Production Control	3
IE 346	Statistical Analysis	3	IE 502	Operations Research	3
	Electives, Restricted	6		Electives, Restricted	9
	Total	15		Total	18

Fourth Year

IE 233	Cost Control	3			
EC 350	Economics of Labor Relations	3	IE 504	Laboratory Thesis	4
	*Math Elective	3		Elective, Free	3
	Elective, General Studies	3		Elective, General Studies	3
	Elective, Restricted	3		Electives, Restricted	6
	Total	15		Total	16

* IE 347 Probability Analysis or any 300 or 400 series math course.

Selection of Electives

Restricted electives are to be chosen in consultation with department members and must be approved by the Chairman of the Department of Industrial Engineering. Students may secure restricted elective guide sheets from the Reception Office or from the department chairman.

TOTAL — Bachelor of Science Degree in Industrial Engineering: 130 Semester Hours Minimum

MATERIALS ENGINEERING

Third Year

	Fall	Sem. Hrs.		Spring	Sem. Hrs.
MT 219	Physical Metallurgy I	3	MT 220	Physical Metallurgy II	3
ME 301	Thermodynamics I	3	MT 304	Mechanical Behavior of Materials	3
	Elective, General Studies	3		Elective, Metallurgy	3
	Elective, Chemistry	4		Elective, General Studies	3
	Elective, Free	3		Electives, Restricted	4
	Total	16		Total	16

FOURTH YEAR

MT 331	Non-Ferrous Metallurgy	3	ME 512	Senior Seminar	3
MT 342	Steels & Their Heat Treatment	3		Elective, Free	3
	Elective, Metallurgy	3		Electives, Restricted	9
	Electives, Restricted	8		Total	15
	Total	17			

Selection of Electives

Each student will meet with the Chairman of the Materials Engineering Department during the Spring term of his second year to select the restricted electives which will result in a program of maximum benefit to the student.

TOTAL — Bachelor of Science Degree in Materials Engineering: 131 Semester Hours Minimum

MECHANICAL ENGINEERING

THIRD YEAR

	Fall	*Sem. Hrs.*		*Spring*	*Sem. Hrs.*
ME 301	Thermodynamics I	3	ME 302	Thermodynamics II	3
ME 344	Mech. of Vibrations	3	ME 311	Machine Elements	3
MT 219	Physical Metallurgy	3	ME 315	M. E. Lab I	2
	Elective, Math	3	ME 321	Fluid Mech.	3
	Elective, General Studies	3		Elective, General Studies	3
	Total	15		Elective, Restricted	3
				Total	17

FOURTH YEAR

	Elective, Free	3	ME 415	M. E. Lab II	2
	Electives, Restricted	12		Elective, Free	3
	Total	15		Electives, Restricted	12
				Total	17

Selection of Electives

Each student will meet with the Chairman of the Mechanical Engineering Department during the Spring semester of his second year, in order to define the program the student will follow his last two years. At this meeting a faculty member will be assigned to act as an adviser to the student during the final two years. The adviser will assist the student in the selection of restricted electives that will result in a program of study that will be of maximum benefit to the student. Some of the areas of specialization that are available to the student are Aerospace-Thermal Science and Mechanical Design.

TOTAL — Bachelor of Science Degree in Mechanical Engineering: 131 Semester Hours Minimum

Course Descriptions
Undergraduate Schools

Accounting

William G. Holman, Chairman

A 111-112. Introductory Accounting. Credit, 6 semester hours.

Prerequisite to all other courses in accounting.

Offered also in Spring Semester on a two nights per week basis.

Familiarizes the student with fundamental principles of accounting. Supplemented by progress tests, problems, and systematic practice work. Interpretation of assets, liabilities, and net worth; preparation of statements; books of original entry; ledgers; and work at the end of a fiscal period.

A 113. Industrial Accounting. Credit, 3 semester hours.

Open only to Arts and Sciences, Engineering and Law Enforcement students.

Acquaints students with the vocabulary of accounting, the accounting cycle, and the presentation of accounting statements.

A 221-222. Intermediate Accounting. Credit, 6 semester hours.

Prerequisite: A 112.

Continuation at a more advanced level of the principles studied in Introductory Accounting. Adapted to present-day changes in the accounting profession. The corporation, asset valuations, liabilities, installment sales and consignments, analysis and interpretation of financial statements, sources and application of funds, depreciation methods, inventory evaluation, reserves, and surplus analysis. Considerable practice in the form of problem solutions. Reference made to the publications of the professional accounting societies.

A 223-224. Cost Accounting. Credit, 6 semester hours.

Prerequisite: A 112.

Cost concepts, classifications, and systems from the point of view of cost determination (accumulation of material, labor, and overhead by jobs, processes, etc.), cost control (budgets, standards, etc. compared to actuals), and cost analysis and reporting for intelligent management decisions. Differential and comparative cost analysis, break-even analysis, capital expenditure planning, and internal profit measurements and pricing policies.

A 331-332. Advanced Accounting. Credit, 6 semester hours.

Prerequisite: A 222.

Final general accounting course covering all phases of accounting not previously covered and not considered of a specialized nature. Given in two sections, neither dependent upon the other. Upon completion of these sections, the student is prepared for advanced study in specialized accounting problems.

A 333. Auditing I. Credit, 3 semester hours.

Prerequisite: A 222.

Evaluation of the effectiveness of the various accounting systems and procedures as they relate to internal control. Auditing procedures to test reliability are developed, followed by teachings of prerequisites that are to be met for auditing standards applicable to "field work." A practice case links the course to practice.

A 334. Auditing II. Credit, 3 semester hours.

Prerequisite: A 333.

Introduction to the profession of auditors (internal and independent). Intricacies and variety of audit report presentations. Full coverage of auditing standards and latest developments in the field of auditing. Principles of internal control questionnaire and audit program designs.

A 335. Income Tax Procedures I. Credit, 3 semester hours.

Prerequisite: A 112.

The law and the procedures for individual income tax returns. Includes the determination of gross income, ordinary gains and losses, capital gains and losses, dividends, deductions of all kinds, and withholding.

A 336. Income Tax Procedures II. Credit, 3 semester hours.

Prerequisite: A 335.

Continuation of the law and procedures to cover installment sales, inventories, accounting etc., and handling taxes of partnerships, estates and trusts, and corporations, including reorganizations, personal holding companies, etc. Processes of filing returns, paying taxes, and getting refunds. Coverage of Social Security, Federal Estate and Gift taxes.

Art

Elizabeth J. Moffitt, Coordinator

ART 101-102. Introduction to Studio Art. Credit, 6 semester hours

This course provides a foundation to further study in the visual arts and is designed to heighten the sensitivity and awareness of the individual. There will be an exploration of the expressive potential of a variety of materials. Problems in drawing, painting, and design. Contemporary art forms will be viewed in their historical relationship to those of the past.

ART 122. Layout and Printing Techniques. Credit, 3 semester hours.

Techniques of layout, lettering, and design in relation to printing methods.

ART 201. Drawing and Painting I. Credit, 3 semester hours.

Problems in drawing will include exercises in coordination of hand and eye, manipulation of line for articulation of space and form, perspective, figure drawing and experience with various drawing materials. In painting, problems in pictorial composition will involve the manipulation of form and color using a variety of pigments and materials.

ART 203. Commercial Art I. Credit, 3 semester hours.

Problems of graphic arts and advertising. Relations between the arts and methods of communication. An introduction to the fields of advertising, illustration, and editorial art; the role of the advertising agency; and the analysis of ideas for visual statement.

ART 204. Commercial Art II. Credit, 3 semester hours.

Prerequisite: Art 203.

The organization and presentation of a project which demonstrates the student's ability to apply theory on a professional level. Work for presentation in the form of a portfolio is developed through individual instruction and criticism

ART 211-212. Design I and II. Credit, 6 semester hours.

Exploration of basic visual elements; line, color, texture, shape, size, volume, space and the psychic response they elicit. Organization of visual elements in effective design. Interaction of color.

ART 231. History of Art to the Renaissance. Credit, 3 semester hours.

World art as an expressive and social phenomenon from its earliest beginnings, through religious and cultural cycles, to the visual developments of the Renaissance.

ART 232. History of Modern Art. Credit, 3 semester hours.

Art of the twentieth century in Europe and America, its roots in the past, its function as an expression of our contemporary civilization.

ART 301. Drawing and Painting II. Credit, 3 semester hours.

Further study in two dimensional formulations by means of exploitation of form and color for expressive content. Experimentation with various drawing techniques for maximum effectiveness. Figure drawing.

ART 302. Advanced Drawing. Credit, 3 semester hours.

Prerequisite: Art 201.

Further study of graphic articulations using a variety of materials: pen, ink, charcoal, pencil, mixed media. Experimentation with techniques and refinement of means. Study of forms in nature. Life drawing.

ART 311. Advanced Design. Credit, 3 semester hours.

The exploration of three dimensional materials for maximum effectiveness in expressive design. Experimentation with clay, plaster, wood, stone, canvas, wire screening, metal, found objects, etc.

ART 312. Lettering. Credit, 3 semester hours.

Prerequisite: Art 211.

Design and execution of basic hand lettering with pen and brush; utilization of hand lettering and type in the design of printed matter; use of letter forms as an element of visual design.

ART 313. Photography. Credit, 3 semester hours.

A course designed to explore the technical aspects of photography as a means for the development of the student's sensitivity to the image as an art form. Laboratory course. Technical demonstrations and experimental laboratory techniques. Emphasis on black and white. Group criticisms. Field trips.

ART 331. Contemporary Art. Credit, 3 semester hours.

Art as an expressive and social phenomenon from 1945 through the developmental happenings of the present.

ART 401. Studio Seminar I. Credit, 1-4 semester hours.

Prerequisites: Art 101-102, Art 201, Art 302 or Art 313, and Art electives.

Drawing on his development through his previous study the student will concentrate on major projects in areas of his choice.

ART 402. Studio Seminar II. Credit, 1-4 semester hours.

Prerequisite: Art 401.

Continuation of Studio Seminar I.

Business Administration

Robert G. Leonard, Chairman

BA 101. Legal Concepts. Credit, 3 semester hours.

Contract law as a foundation for anticipating legal difficulties and making the best use of legal advice. Functional and policy problems in the legal resolution of a controversy. The origin and development of common, statutory, and constitutional law and of the functioning of the judicial system.

BA 102. Business Law. Credit, 3 semester hours.

Prerequisite: BA 101.

Agency, partnerships, corporations, and legal aspects of marketing.

BA 105. Principles of Marketing. Credit, 3 semester hours.

The fundamental functions of marketing involving the basic principles of the flow of goods and services from producer to consumer. Marketing methods, policies, and problems of the manufacturer, wholesaler, and retailer are reviewed through analysis of channels of distribution, price policies, competition, and market information.

BA 107. Advertising and Promotion. Credit, 3 semester hours.

Prerequisite: BA 105 or equivalent.

The design, management, and evaluation of the various communications programs involved in marketing and public relations.

BA 113. Business Finance. Credit, 3 semester hours.

Prerequisite: A 111 or Instructor's consent.

Brief study of the unincorporated business enterprise. The modern corporation. Basic security types of stocks and bonds, capital structure, promotion, investment, banking, government regulation, administration, sources and uses of working capital, expansion, combinations, mergers, refinancing and recapitalization, and failure and reorganization.

BA 125. Management and Organization. Credit, 3 semester hours.

The business organization, stressing the conceptual foundations of business. Ethical and behavioral issues in organizing. The authority, responsibility, and accountability in organization and management which underlie businesses of every legal form.

BA 128 Quantitative Techniques in Management. Credit, 3 semester hours.

Prerequisite: M 127 or M 115, or Instructor's consent.

Breakeven analysis, probability theory, inventory models, matrix algebra, linear programming, games and strategy, Markov analysis, queuing theory with a stress on operations research concepts.

BA 203. Physical Distribution Management. Credit, 3 semester hours.

Prerequisite: BA 105.

Planning, organization, management, and operation of logistics systems, with emphasis on the effective use of transportation to meet the objectives of a business.

BA 216. Statistics. Credit, 3 semester hours.

Prerequisite: BA 128 or Instructor's consent.

Statistical populations, parameters for decision, sample selection and distribution, probability theory, risk and uncertainty in estimation and testing problems, data flow, and error and bias occurring in sampling.

BA 221. Law of Sales. Credit, 3 semester hours.

Prerequisite: BA 102.

Offered in the evening by arrangement.

This course is an advanced study of Business Law comprising: bailments; duties and liabilities of bailees, common carriers, and warehousemen; the laws governing the rights of parties engaged in the transfer of personal property. Questions of title, risks assumed, rights of creditors, express and implied warranties, buyers' and sellers' remedies, together with the business background out of which such relations arise, are also considered.

BA 222. Law of Commercial Paper and Bankruptcy. Credit, 3 semester hours.

Offered in February of EVEN years. Offered in the evening by arrangement.

This course is a study of the Negotiable Instruments Law, dealing with negotiable promissory notes, bills of exchange and bank credits with an analysis of their form and function in commercial transactions. A brief survey of bankruptcy procedure under the federal bankruptcy laws is included.

BA 227. Risk and Insurance. Credit, 3 semester hours.

Prerequisite: BA 105.

The importance of risk in business affairs; risk situations analyzed; the different methods of meeting risk considered; extended consideration given to the various forms of insurance coverage.

BA 229. Financial Management. Credit, 3 semester hours.

Prerequisite: BA 113.

Analytical techniques for dealing with financial problems and their application to corporate financial management. Capital budgeting, cost of funds, capital structure, valuation, and some aspects of investment problems.

BA 230. Investments. Credit, 3 semester hours.

Prerequisite: BA 113 or EC 134 or Instructor's consent.

Investment media and institutions in the capital markets, the determination of investment values, and the analytical tools of investment appraisal and portfolio management.

BA 231. Industrial Relations. Credit, 3 semester hours. (See SS 411.)

Prerequisite: BA 125.

Human factors in the management function including union-management relations, history of human relations, individual and group productivity, the company, and the community.

BA 301. Retailing. Credit, 3 semester hours.

Prerequisite: BA 105.

Modern merchandising methods used by retail stores, including store organization, buying, pricing, receiving, marketing, publicity, selling, record keeping, and stock control.

BA 302. Industrial Marketing. Credit, 3 semester hours.

Prerequisite: BA 105.

Practices and policies in the distribution of industrial goods, including purchasing practices, market analysis, channels of distribution, distribution and pricing policies, competitive practices, and operating costs.

BA 312. International Business. Credit, 3 semester hours.

Prerequisite: BA 105.

Principles of International Marketing; the theory of trade and commercial policy; foreign exchange rates, exchange control, and foreign investments; world trade in commodities; methods of exporting and importing; and an evaluation of comparative distribution systems.

BA 315. Marketing Management. Credit, 3 semester hours.

Prerequisite: BA 105.

Policies, practices, and problems in the field of marketing management; product development; product planning for promotion; market investigation, quantitative and qualitative; pricing and price policies; planning the marketing effort; and control of marketing operations.

BA 316 Sales Management. Credit, 3 semester hours.

Prerequisite: BA 105.

Problems and resulting policies encountered in the management of a sales organization. Qualifications and duties of the sales manager, departmental organization; recruiting, selecting, training, stimulating, supervising, compensating, and routing salesmen; and territories, quotas, expenses, promotions, and policies.

BA 333. Applied Statistics. Credit 3 semester hours.

Prerequisite: BA 216.

Quantitative analysis of business problems, development and testing of statistical inferences, and Bayes' theorem to revise probabilities in the light of information obtained from statistical studies.

BA 342. Marketing Research. Credit, 3 semester hours.

Prerequisites: BA 105 and BA 216.

Use of qualitative and quantitative analysis of the markets in which business operates. Sales analysis, advertising research, product planning and analysis, sources of data and methods of their collection, sampling techniques, methods of tabulation and analysis, methods of organizing and conducting marketing research, budget considerations, etc., with outside readings and term reports.

BA 449. Independent Study. Credit, 3 semester hours.

Independent study to be performed in a project of interest to the student and under direction of a faculty member to be designated by the department chairman. Project, student, and faculty director must be approved by both the department chairman and the Dean of the Business School.

BA 510. Managerial Economics. Credit, 3 semester hours.

Prerequisite: Senior standing and EC 134 and BA 113.

Integrates principles and concepts from the several business and economic fields to exemplify decision processes and strategies applicable to the management of the individual firm.

BA 512. Seminar. Credit, 3 semester hours.

Prerequisite: Senior standing.

Each participant will develop a scholarly paper involving independent study and research under faculty guidance

Chemistry

William H. Nyce, Chairman

CH 103. Introduction to General Chemistry w/Lab Credit, 3 semester hours.

Introductory course in inorganic chemistry dealing with elements, compounds, reactions, atomic structure, chemical bonding solutions, and nuclear reactions. Laboratory work involves weighing and experiments related to the material covered in lectures.

Laboratory Fee: $15.00.

CH 105. General Chemistry I w/Lab. Credit, 4 semester hours.

Prerequisite: CH 103 or one high school unit of chemistry, or written qualifying examination.

Application of nuclear reactions, thermochemistry, electrochemistry, the production and properties of metals, the properties of the halogen and sulfur groups, and organic chemistry. Laboratory work related to the material covered.

Laboratory Fee: $15.00.

CH 106. General Chemistry II w/Lab. Credit, 4 semester hours.

Prerequisite: CH 105.

Chemical equilibria, chemical bonding, solutions, the chemistry of nitrogen, carbon, silicon, and boron; the use of spectroscopy to determine structure of compounds. Laboratory work includes experiments in qualitative analysis.

Laboratory Fee: $15.00.

CH 211. Quantitative Analysis w/Lab. Credit, 4 semester hours.

Prerequisite: CH 106.

Theory and laboratory training in the preparation of solutions, volumetric and gravimetric analysis, and the use of special laboratory instruments.

Laboratory Fee: $15.00.

CH 301-302. Organic Chemistry w/Lab. Credit, 8 semester hours.

Prerequisite: CH 106.

The common reactions of aliphatic and aromatic chemistry, emphasis on reaction mechanisms. Laboratory assignments on the technique needed in organic synthesis.

Laboratory Fee: $15.00 per semester.

CH 321-322. Plastics and Polymer Chemistry. Credit, 6 semester hours.

Prerequisites: CH 106, CH 302.

All phases of the plastics and polymers field, including the chemistry involved, methods, properties of the plastics, and uses of the various materials.

CH 341. Instrumental Methods of Analysis w/Lab. Credit, 4 semester hours.

Prerequisites: CH 106, CH 211.

The theory of various instrumental methods, including visible ultraviolet and infrared spectroscopy, gas chromatography, mass spectrometry, and nuclear magnetic resonance spectroscopy. Laboratory identification of compounds by the methods discussed in the lectures.

Laboratory Fee: $15.00.

CH 351. Qualitative Organic Chemistry w/Lab. Credit, 4 semester hours.

Prerequisite: CH 302.

A one-semester laboratory course dealing with the systematic identification of organic compounds.

Laboratory Fee: $15.00.

CH 361. Nuclear and Radiochemistry. Credit, 3 semester hours.

Prerequisites: CH 106, M 117.

Natural and induced radioactivity, nuclear reactions, and the chemistry of fission products. Methods of detecting and measuring nuclear radiation. The various applications of radiochemistry in industry and the chemical effects of radiation.

CH 401-402. Advanced Organic Chemistry. Credit, 6 semester hours.

Prerequisite: CH 302.

The mechanism of organic reactions, advanced problems in synthetic organic chemistry, and special topics such as stereochemistry and photochemistry.

CH 421-422. Advanced Inorganic Chemistry w/Lab. Credit, 8 semester hours.

Prerequisite: CH 431. Corequisite: CH 432.

Modern structural concepts, reaction mechanisms, the application of principles of physical chemistry and bonding theory in inorganic chemistry.

Laboratory Fee: $15.00 per semester.

CH 431-432. Physical Chemistry w/Lab. Credit, 8 semester hours.

Prerequisites: CH 106, PH 202, and M 203.

Fundamental laws of gases, thermodynamics, the theory of atomic and molecular structure, kinetics, and phase equilibria. Laboratory work enables the student to evaluate this subject by studying physical and chemical data.

Laboratory Fee: $15.00 per semester.

CH 433. Advanced Physical Chemistry. Credit, 3 semester hours.

Prerequisite: CH 432.

Emphasis on the fundamentals of quantum mechanics, statistical mechanics, molecular bonding theory, and spectroscopy. Offered only in the evening.

CH 441. Analytical Chemistry w/Lab. Credit, 4 semester hours.

Prerequisite: CH 431. Corequisite: CH 432.

Application of instrumental methods to inorganic and organic methods of analysis, including mass, ultraviolet and infrared spectrophotometry, chromatography, and electroanalytical analysis.

Laboratory Fee: $15.00

CH 451-452. Thesis for Undergraduate Chemistry Majors w/Lab. Credit, 4 semester hours.

Prerequisites: CH 302, CH 432.

An original investigation in the laboratory under the guidance of a member of the department. Oral discussion of the completed work before the staff at the end of the second semester. Final thesis report. Required for all senior chemistry majors.

Laboratory Fee: $15.00 per semester.

CH 461. Chemical Spectroscopy: Technique. Credit, 3 semester hours.

Prerequisite: CH 432.

Introduction to the elementary theory with emphasis on techniques and interpretation of data obtained in applications of infrared, Raman, visible ultraviolet, nuclear quadrupole, electron spin, and nuclear magnetic resonance spectroscopy to the solution of chemical problems. Offered only in the evening.

CH 511-512. Seminar I and II. Credit, 2 semester hours.

Prerequisites: CH 302, CH 432.

Reports and discussions in various fields of chemistry reviewed by students and staff.

Plant Visitations. Credit, none.

Open to junior and senior chemistry majors. Visits to plants in the area to investigate plant and laboratory facilities in the chemical industry.

SC 261-262. Biochemistry w/Lab. Credit, 8 semester hours.

See description under Science and Biology.

Civil Engineering

John C. Martin, Chairman

CE 201. Statics. Credit, 3 semester hours.

Prerequisites: M 118 and PH 108.

Composition and resolution of forces in two and three dimensions. Equilibrium of forces in stationary systems. Analysis of trusses. Centroids and second moments of areas, distributed forces, friction, shear and bending moment diagrams.

CE 202. Mechanics of Materials I. Credit, 3 semester hours.

Prerequisite: CE 201.

Elastic behavior of structural elements under axial, flexural, and torsional loading. Stress in and deformation of members, including beams. Lectures supplemented with laboratory exercises.

CE 203. Surveying. Credit, 2 semester hours.

Theory and practice of engineering measurements using tape, level, and transit. Practice in topographic mapping, making of profiles, and computations to determine areas of land and volumes of earthwork.

CE 204. Water Supply and Sanitary Engineering. Credit, 3 semester hours.

Introduction to the principles of water supply and treatment systems and disposal are described. Course offered, primarily, for non-engineering majors to include the major topics, in a qualitative manner, covered in CE 402 and CE 404.

CE 301. Transportation Engineering. Credit, 3 semester hours.

Prerequisite: IE 204.

Development, organization, administration, and interrelation of transportation systems and facilities, including highways, railroads, airports, rapid transit systems, waterways, and pipe lines. Emphasis placed on economics of location of resources, industry, and population.

CE 302. Building Construction. Credit, 3 semester hours.

Initiation into the planning and anatomy of buildings, materials available and their uses, some principles of construction procedures, general estimating of costs, and relative merits of various types of construction.

CE 303. Steel Design and Construction. Credit, 3 semester hours.

Prerequisite: CE 307.

Analysis, design and construction of steel structures. Design of frames, members, connections and other related topics. Tension members, compression members, beams, girders, trusses and rigid frames. Fabrication and erection, including shop practice.

CE 304. Soil Mechanics. Credit, 3 semester hours

Prerequisites: M 203 and CE 202.

Structural composition of the earth's crust and the mechanics of its formation. Soil classifications and physical properties are related to the principles underlying the behavior of soils subjected to various loading conditions. Subsurface exploration and laboratory exercises.

CE 305. Highway Engineering. Credit, 3 semester hours.

Prerequisite: CE 301.

Study of traffic, methods of making traffic surveys, safety and accident records, and methods of traffic control. Emphasis on planning of major highways, intersections, and urban streets. Study of pavements, drainage, and general administration and operation.

CE 306. Hydraulics. Credit, 3 semester hours.

Prerequisite: ME 204.

The mechanics of fluids and fluid flow. Laminar and turbulent flow. Flow in pipes and open channels. Orifices and weirs. Fluid pressures. Wave action and erosion. Lectures supplemented with laboratory demonstrations.

CE 307. Mechanics of Materials 2. Credit, 3 semester hours.

Prerequsite: CE 202.

Elastic and plastic behavior of structural elements such as beams, columns, and shafts under direct and combined loading. Ultimate strength design, theory of failure, composite member design, and an introduction to statically indeterminate structures.

CE 314. Concrete Design and Construction. Credit, 3 semester hours.

Prerequisites: CE 307.

Analysis, design, and construction of both plain and reinforced concrete structures. Design, utilizing both working stress and ultimate strength techniques, of beams, slabs, columns, and walls. Construction methods, including forming, reinforcing, concrete placing, prestressing and pre-casting will be described.

CE 401. Foundation Design and Construction. Credit, 3 semester hours.

Prerequsite: CE 304.

Design of isolated and combined footings, mats, retaining walls, piers, abutments, pile foundations, and similar structural elements used to safely support buildings, bridges, and other structures.

CE 402. Water Supply and Power. Credit, 3 semester hours.

Prerequisite: CE 306.

Design of water supply, storage, treatment, and distribution systems. Principles of ground water as it pertains to water supply and wells. Introduction to desalination methods, including economic considerations. Water pollution and its control. Principles of hydroelectric power development.

CE 403. City Planning. Credit, 3 semester hours.

Prerequisite: CE 301.

Engineering, social economic, political, and legal aspects of city planning. Emphasis placed on case studies of communities in Connecticut. Zoning. Principles and policies of redevelopment.

CE 404. Sanitary Engineering. Credit, 3 semester hours.

Prerequisite: CE 402.

Planning of sewer systems, methods of sewage treatment, general construction and operation of plants, handling of industrial and solid wastes. Incineration.

CE 405. Indeterminate Structures. Credit, 3 semester hours.

Prerequisites: CE 303 and CE 314.

Analysis and design of continuous beams, rigid frames, arches, and multi-story structures of concrete and steel. Elastic and plastic design principles.

CE 407. Contracts and Specifications. Credit, 3 semester hours.

Prerequisite: CE 302.

Principles of contract formation, execution, and termination. Study of specifications and practice in their preparation. Other legal matters of importance to engineers.

CE 501. Design Project. Credit, 3 semester hours.

Prerequisite: CE 407.

Planning and design of an engineering project, starting with map and general requirements as provided by an owner. Preparation of design drawings for the layout and structures. Estimate of cost. Planning construction procedures and schedule.

Economics

Phillip S. Kaplan, Chairman

EC 133. Principles of Economics I. Credit, 3 semester hours.

Foundations of economic analysis, including economic progress; resources, technology, private enterprise, profits and the price system. Macroeconomics including national income, employment and economic growth. Price levels, money and banking, the Federal Reserve System, theory of income, employment and prices, business cycles and problems of monetary, fiscal, and stabilization policy.

EC 134. Principles of Economics II. Credit, 3 semester hours.

Prerequisite: EC 133.

Microeconomics including markets and market structure and the allocation of resources. The distribution of income, the public economy, the international economy, and current economic problems.

EC 300. Economic History of the U. S. Credit, 3 semester hours.

Development of American economic life in the various stages of agriculture, trade, industry, finance, and labor. Change of economic practices and institutions, particularly in business, banking, and labor. The changing role of government.

EC 310. Principles of Economic Geography. Credit, 3 semester hours.

Distribution of resources, industries, and population in relation to physical, economic and technological factors. Principles of economic location and regional development.

EC 311. Government Regulation of Business. Credit, 3 semester hours.

Prerequisites: EC 133-134.

An appraisal of public policy toward transportation, trusts, monopolies, public utilities, and other forms of government regulation of economic activity.

EC 314. Public Finance. Credit, 3 semester hours.

Prerequisites: EC 133-134.

Theory and practice of public taxation. The budgetary process at all levels of government.

EC 320. Mathematical Methods in Economics. Credit, 3 semester hours.

Prerequisites: M 115-116.

Applications of various mathematical concepts and techniques in macroeconomic and microeconomic analysis. Special emphasis on the design and interpretation of mathematical models of economic phenomena.

EC 336. Money and Banking. Credit, 3 semester hours.

Prerequisites: EC 133-134.

Nature and functions of money, commercial banking system, Federal Reserve System and the Treasury, monetary theory, financial institutions, international financial relationships, history of money and monetary policy in the United States, and current problems of monetary policy.

EC 340. Microeconomic Analysis.

Prerequisites: EC 133-134.

A study of the determination of the prices of goods and production factors in a free market economy and the role of prices in the allocation of resources.

EC 342. International Economics. Credit, 3 semester hours.

Prerequisites: EC 133-134.

The role, importance, and currents of international commerce; the balance of international payments; foreign exchange and international finance; international trade theory; problems of balance of payments adjustment; trade restrictions; international control of raw materials; economic development and foreign aid.

EC 345. Comparative Economic Systems. Credit, 3 semester hours.

Prerequisites: EC 133-134.

A comparative study of the economic organization, resource allocation and growth problems of the United States, British and French economic systems and the economic systems of the U.S.S.R., Poland, and Yugoslavia.

EC 350. Economics of Labor Relations. Credit, 3 semester hours.

Prerequisites: EC 133-134.

History of the union movement in the United States, union structure and government, problems of collective bargaining, economics of the labor market, wage theories, unemployment, governmental policy and control, and problems of security.

EC 410. Econometrics. Credit, 3 semester hours.

Prerequisite: EC 320.

The application of mathematical and statistical methods to both micro- and macroeconomic policy issues.

EC 440. Economic Development. Credit, 3 semester hours.

Prerequisites: EC 133-134.

Economic problems of underdeveloped countries and the policies necessary to induce growth. Individual projects required.

EC 442. Economic Thought. Credit, 3 semester hours.

Prerequisites: EC 133-134.

The development of economic doctrine from mercantilism and Adam Smith to the thinking of modern day theorists. Emphasis upon the main currents of thought with the applicability to present-day problems. Individual study and reporting.

EC 445. National Income Analysis and Business Cycles. Credit, 3 semester hours.

Prerequisites: EC 133-134, EC 336, and A 111.

An investigation of the makeup of the national income and an analysis of the factors that enter into its determination; the nature of economic fluctuations and a survey of theories explaining the causes of cycles in general economic activity; counter-cyclical policies; unemployment and economic growth; forecasting economic activity.

EC 450. Thesis. Credit, 3 semester hours.

The undertaking of a written report on a research project. No class meetings, but periodic conferences with the thesis supervisor. Required of all majors.

Electrical Engineering

John D. Driscoll, Chairman

EE 223-224. Principles of Electrical Engineering. Credit, 6 semester hours.

Prerequisite: M 118.

Basic concepts in modern network thoeory and network techniques in analyzing simple and complex electric circuits. Definitions of current voltage relations, circuit elements, resistance, inductance, and capacitance. Circuit equilibrium equations, transformation, Kirchoff's law, network theorems, passive and active networks, superposition. Thevenin and Norton's theorems, d-c transients, solution of simple electric circuits in the sinusoidal steady state by vector and complex algebra. Impedance, capacitance, and reasonance concepts, single phase and three phase alternating currents and voltages, power relations. Magnetic fields and circuits, electromechanical energy conversion.

EE 331-332. Network Analysis I and II. Credit, 6 semester hours.

Prerequisite: EE 224 and M 203.

Review of basic current theory. Loop and nodal equations and methods of solution. Matrix notation. General network theorems. Input and transfer admittances, impedances and transfer functions. Symmetrical component analysis. Three-phase circuits, balanced and unbalance. Other polyphase circuits. Fourier series and integrals. Fourier and LaPlace transforms, direct and inverse. Operational methods applied to transients in

EE 336. Instrumentation Electronics. Credit, 3 semester hours.

Prerequisite: PH 209.

Cannot be taken for credit by electrical engineering students.

An introduction into instrumentation electronics aiming to provide a working knowledge and understanding of electronic instruments and controls as used in industrial processes. Starting with simple electrical measurements, the course subsequently deals with power supplies, transistor and vacuum tube amplifiers, and oscillators. Practical servo systems and operational amplifiers are treated, as well as simple circuits for electronic switching, timing, and digital counting.

EE 343-344. Electrical Machines I and II. Credit, 6 semester hours.

Prerequsite: EE 331 concurrently.

Processes for the electro-mechanical conversion of energy. The fields, forces, and torques in magnetic systems. Theory, characteristics, applications, and design of direct-current machines. Theory, performance, and applications of transformers, AC generators, synchronous motors, single and polyphase induction motors.

EE 347-348. Electronic Devices and Circuits I and II. Credit, 6 semester hours.

Prerequisite: EE 331 concurrently.

Study of the fundamental principles and uses of electron devices in electronic circuits. Transistor circuits: Bias Stability, models, and frequency response. Multi-stage circuits, Feedback Amplifiers, Tuned Amplifiers and frequency response of RC coupled amplifiers are analyzed. Power and audio amplifiers.

EE 349. Electrical Engineering Laboratory I. Credit, 2 semester hours.

To be taken concurrently with EE 343 and EE 347.

Laboratory experiments and problems associated with electronic circuits and devices.

Note: Part-time students are charged for a standard 3 semester hour course.

EE 351-352. Electrical Systems Analysis I and II. Credit, 6 semester hours.

Prerequisites: EE 331 and M 204.

A study of the techniques for analyzing linear systems. Dual systems. Fourier series and integral, Convolution and Superposition Integral and their use in the solution of engineering problems. Feedback and Sample Data Systems. Introduction to and use of signal flow graphs. Pole-zero Analysis. Distributed Networks. Numerical Solution to equations. State Equations. Probability.

EE 353. Electrical Engineering Laboratory II. Credit, 2 semester hours.

Prerequisites: EE 348 and EE 349 concurrently.

Laboratory experiments and problems associated with electrical circuits and devices.

Note: Part-time students are charged for a standard 3 semester hour course.

EE 355-356. Switching and Logical Design. Credit, 6 semester hours.

Prerequisites: EE 347 and EE 348 concurrently.

Study of the fundamental concepts of digital systems. Boolean algebra and its use in logical design. Basic logic circuits. Map and tabular methods of minimization. Synchronous and synchronous sequential circuits. Hazards, arithmetic operations, coding, storage elements, logical design techniques, switching theorems.

EE 420. Introduction to Systems Engineering. Credit, 3 semester hours.

Prerequisite: EE 351.

Systems engineering principles and practices. Probability and statistics and their application to stochastic systems. Simulation and mathematical modeling of deterministic and stochastic systems. Introduction to information and theory.

EE 429. Measuring Principles and Transducers. Credit, 3 semester hours.

Prerequisites: EE 336 or EE 347.

The principles of measuring elements and transducers for electrical engineers. Mechanical and industrial engineers who have the necessary prerequisites will also be able to profit from the course. An introduction to the science of measurement (Metrology) and the application of this science to the measurement of quantities of economic value in industrial, military, and scientific processes. Laboratory sessions provide the student with first-hand familiarization of the principles of the subject.

EE 437. Industrial Power Systems Engineering. Credit, 3 semester hours.

Prerequisite: EE 332 concurrently.

Structure of power and distribution of systems; symmetrical components; analysis of unbalanced polyphase power systems; fault calculations; applications to problems of grounding, relaying, and unbalanced operation of apparatus.

EE 438. Electric Power Transmission. Credit, 3 semester hours.

Prerequisite: EE 437.

The fundamentals of electric generation, transmission, and distribution. Transient performances of non-linear characteristic circuits, and power system stability.

EE 441. Analog and Digital Computer Applications. Credit, 3 semester hours.

Prerequisites: EE 332, EE 348 and M 204.

The application of the analog and digital computers in the solution of engineering problems. The concept of an algorithm, numerical analysis, and programming. Operational amplifiers.

EE 445. Communications Theory. Credit, 3 semester hours.

Prerequisite: EE 351.

The analysis of communications circuits and the design of the components of communication systems. Signal analysis, transmission of signals, power density spectra, amplitude, and pulse modulation. Performance of communications systems, noise and information transmission theory.

EE 446. Pulse and Digital Circuits. Credit, 3 semester hours.

Prerequisite: EE 348 and EE353 concurrently.

A study of circuits currently used in computers and other electronic devices. Topics covered to be chosen from the following: Linear and nonlinear waveshaping, pulse amplifiers, multivibrators, logic circuits and computer subsystems, counters, sweep oscillators, and negative resistance circuits.

EE 450-451. Analysis and Design of Active Networks. Credit, 6 semester hours.

Prerequisite: EE 348.

Study of the techniques for analysis and design of circuits employing active devices with particular emphasis on transistors. Feedback oscillators. Field effect transistor and tunnel diode characteristics and uses. Power supplies and regulators. Integrated circuits. Pulse and Switching Circuits. Broadbanding techniques and cascading effects.

EE 455. Feedback Systems. Credit, 3 semester hours.

Prerequisite: EE 351.

Study of physical system using feedback to form a closed loop. Investigate stability from Root Locus, Routh, Bode and Nyquist viewpoints. Performance and design, including series of feedback compensation, multiple inputs, and disturbances. Mathematical modeling of system elements and systems.

EE 461. Electromagnetic Theory. Credit, 3 semester hours.

Prerequisite: EE 332 and M 204.

Basic electromagnetic theory as related to the static fields of electric charges and the magnetic fields of steady electric currents. Fundamental field laws. Maxwell's equations, energy distributions, scalar and vestor potentials, method of images, boundary relations, magnetization, polarization, time varying electric and magnetic fields, field plotting. Vector mathematics is used in the mathematical analysis.

EE 462. Microwave Fundamentals. Credit, 3 semester hours.

Prerequisite: EE 461.

The development and application of electromagnetic-field theory to the analysis of high-frequency circuits, wave propagation, reflection in various media including waveguides, and resonant cavities. The theory of operation of such devices as klystron, magnetron, and traveling wave tubes.

EE 500. Senior Seminar. Credit, 3 semester hours.

Prerequisite: Instructor's consent.

Open to Seniors in Electrical Engineering.

Special topics in the field of electrical engineering. Arranged to suit the interest and requirements of the student, under the supervision of a staff member.

EE 504. Laboratory Thesis. Credit, 3 semester hours.

Prerequisite: Instructor's consent.

Open to Seniors in Electrical Engineering.

Advanced laboratory testing and special problems. Students work on problems of their selection with the approval of the instructor. The work may be done in the form of a thesis or series of experiments.

English

Douglas Robillard, Chairman

EA. College Preparatory English. One semester. No credit.

A review of the fundamentals of English for students who do not meet the English requirements for admission to the College. Practice given in writing as well as in grammar.

EB. Reading Laboratory. One semester. No credit.

Helps the student to read faster with greater comprehension, to increase vocabulary, and to study more effectively. Supervised reading, training films, exercises and discussions.

EF. English as a Second Language. One semester. No credit.

Designed for foreign-born students whose English is inadequate to do college-level work. Particular emphasis on individual pronunciation problems and use of American English idioms. Laboratory required.

E 113. English Composition. Credit, 3 semester hours.

Prerequisite: Satisfactory performance on English Placement Examination or completion of EA College Preparatory English.

Theme writing with emphasis on thematic content, paragraphing, sentence construction, grammatical principles, and diction. Reading of essays to stimulate thought and illustrate rhetorical principles.

E 114. Speech. Credit, 3 semester hours.

A disciplined approach to oral communication. Objectives are to develop proficiency in locating, organizing, and presenting material and to help the student gain confidence and fluency when speaking extemporaneously.

E 201-202. World Literature I and II. Credit, 6 semester hours.

Prerequisite: E 113.

Selected translations of non-Western literature and of Western literature from Homer to the present. Emphasis upon literary, cultural and philosophical values.

E 206. Composition and Literature. Credit, 3 semester hours.

Prerequisite: E 113.

Further practice in theme writing. Reading of poetry, fiction, and drama in order to develop skill in analyzing and interpreting literature.

E 211-212. Survey of English Literature I and II. Credit, 6 semester hours.

Prerequisites: E 113, E 206.

Readings in English Literature from its beginnings to the present, with attention to its historical and social backgrounds.

E 213. Survey of American Literature I. Credit, 3 semester hours.

Intellectual and literary movements from Colonial times to the Civil War.

E 214. Survey of American Literature II. Credit, 3 semester hours.

Intellectual and literary movements from the Civil War to the present.

E 217. Survey of Black American Literature. Credit, 3 semester hours.

A study of Black American poets, novelists, essayists and dramatists from the Colonial Era to the present, including such writers as Frederick Douglass, W. E. B. DuBois, Countee Cullen, Richard Wright, James Baldwin, Leroi Jones, and Eldridge Cleaver.

E 220. Report Writing. Credit, 3 semester hours.

Prerequisite: E 113.

Study of the standards inherent in effective reporting, both formal and informal, and of the principles of business letter writing, with practice in writing letters, memos, and reports. To be offered only in Fall semester.

E 267-268. Creative Writing. Credit, 6 semester hours.

Prerequisite: E 206 and Instructor's consent.

Practice in writing the short story, poetry, drama, or non-fiction; choice of genre based upon inclination and ability of the student. Analysis of published materials and student work.

E 301. Literary Criticism and Scholarship. Credit, 3 semester hours.

Major critical theories, with readings from Plato and Aristotle to the present. Bibliographic tools and methods of research.

E 302. History of the English Language. Credit, 3 semester hours.

The development and structure of English, including its Indo-European origins and the elements of Anglo-Saxon. Major emphasis on Middle English and the transition to Modern English. Some study of the distinctive coinages of American English.

E 323. Sixteenth-Century Poetry and Prose. Credit, 3 semester hours.

The social and historical backgrounds of the English Renaissance; readings in the prose writers and in Wyatt, Surrey, Spenser, Sidney, and their contemporaries.

E 326. English Drama to 1642. Credit, 3 semester hours.

The development of the English drama from its beginnings to the middle of the seventeenth century, excluding Shakespeare. Major emphasis upon the Elizabethan and Jacobean drama.

E 341-342. Shakespeare. Credit, 6 semester hours.

E 341 is a prerequisite for E 342.

Introduction to representative comedies, history, plays, tragedies and poems.

E 353. Literature of the Romantic Era. Credit, 3 semester hours.

Poetry and prose of the major Romantics — Wordsworth, Coleridge, Byron, Shelley, Keats, Lamb, and Hazlitt — with attention given to the milieu of the writers, the Continental background and theories of Romanticism.

E 356. Later Nineteenth-Century English Literature. Credit, 3 semester hours.

Poetry and prose from 1830-1900. The works of Tennyson, Browning, Arnold, Swinburne, Carlyle, Mill, Newman, Ruskin, and others studied in the light of the social, political, and religious problems of the period.

E 361. Modern British Literature. Credit, 3 semester hours.

British fiction, drama, and poetry from 1900 to the present. Includes works of Conrad, Joyce, Lawrence, Woolf, Huxley, Forster, Shaw, Yeats, Auden, Spender, and Dylan Thomas.

E 362. The Age of Donne and Milton. Credit, 3 semester hours.

Major writers of prose and poetry during the period 1600-1660: Donne, Milton, Burton, Bacon, Herbert and others.

E 371. Literature of the Neoclassic Era. Credit, 3 semester hours.

British writers of the period 1660-1760, with emphasis upon Dryden, Pope, Swift, Johnson, and others.

E 375. The Age of Chaucer. Credit, 3 semester hours.

A detailed reading and critical study of Chaucer's *Canterbury Tales,* with some study of his predecessors and the medieval cultural milieu.

E 390. The English Novel I. Credit, 3 semester hours.

The development of the novel in England from Defoe to Dickens and Thackeray.

E 391. The English Novel II. Credit, 3 semester hours.

The development of the novel in England from George Eliot and Hardy to the present.

E 392. Literature of the American Renaissance. Credit, 3 semester hours.

Intensive study of the writings of such figures as Emerson, Thoreau, Hawthorne, Melville, and Whitman, whose works are analyzed in the light of the influences and traditions which led to America's cultural independence.

E 402. Modern Poetry. Credit, 3 semester hours.

A study of the works of representative twentieth-century British, American, and Continental poets.

E 405. Modern Drama. Credit, 3 semester hours.

Principal movements in Continental, British, and American drama from Ibsen to the present.

E 406-409. Continental Fiction. Credit, 3 semester hours.

(One course each semester.)

Selected fiction, in translation, of the European masters, primarily Russian, French, German, or Spanish. Topic to be announced for each semester.

E 478. Contemporary American Literature. Credit, 3 semester hours.

Intensive study of developments in American fiction, poetry, and drama of our time. Readings in the works of such writers as Wolfe, Malamud, Bellow, Theodore Roethke, Robert Lowell, Arthur Miller, and Tennessee Williams.

E 481-488. Studies in American Literature. Credit, 3 semester hours.

Special topics in American Literature, which may include concentration upon a single figure, a group of writers, or a literary theme. Several sections, each on a different topic, may run concurrently.

E 491-498. Studies in English Literature. Credit, 3 semester hours.

Special topics in English Literature, which may include concentration upon a single figure, a group of writers, or a literary theme. Several sections, each on a different topic, may run concurrently.

Foreign Languages

Bruce A. French, Coordinator
Robert W. Woodworth, Director of Language Laboratory

FR 101-102. Elementary French. Credit, 6 semester hours.

Stresses pronunciation, aural comprehension, and basic conversation; the fundamental principles of grammar; reading comprehension. Not open to students who offer for college entrance more than one year of high school French.

FR 201-202. Intermediate French. Credit, 6 semester hours.

Prerequisite: French 101-102 or equivalent.

Conversation based on the reading of modern prose texts; drill in written and oral self-expression; a review of the principles of grammar.

FR 301-302. Main Currents of French Literature. Credit, 6 semester hours.

Prerequisites: FR 201-202 or equivalent.

Writings representative of significant currents in French literature from the Middle Ages to the Twentieth Century. Opportunity to improve listening and speaking ability. Conducted in French. Laboratory optional, but recommended.

GR 101-102. Elementary German. Credit, 6 semester hours.

Stresses the fundamental principles of grammar; training in pronunciation, aural comprehension and basic conversation. Some work in the language laboratory outside of class may be required. Not open to students who offer for college entrance more than one year of high school German.

GR 201-202. Intermediate German. Credit, 6 semester hours.

For students with two years of high school German or one year of college German. Reading comprehension (some scientific texts), advanced study of grammar, composition, and oral self-expression.

IT 101-102. Elementary Italian. Credit, 6 semester hours.

Stresses pronunciation, aural comprehension, and basic conversation; instruction in the fundamental principles of grammar; training in reading comprehension. Not open to students who offer for college entrance more than one year of high school Italian.

IT 201-202. Intermediate Italian. Credit, 6 semester hours.

Prerequisite: IT 101-102 or equivalent.

For students with two years of high school Italian or one year of college Italian. Conversation, advanced study of grammar and composition. Reading in classical and modern writers.

RU 101-102. Elementary Russian. Credit, 6 semester hours.

Fundamental principles of grammar; training in pronunciation, aural comprehension, and basic conversation. Some work in the language laboratory outside of class may be required. Not open to students who offer for college entrance more than one year of high school Russian.

RU 201-202. Intermediate Russian. Credit, 6 semester hours.

For students with two years of high school Russian or one year of college Russian. A review and continuation of the principles of grammar, greater emphasis on reading comprehension, further drill in written and oral self-expression.

SP 101-102. Elementary Spanish. Credit, 6 semester hours.

Stresses pronunciation, aural comprehension, and basic conversation; instruction in the fundamental principles of grammar; training in reading comprehension. Not open to students who offer for college entrance more than one year of high school Spanish.

SP 201-202. Intermediate Spanish. Credit, 6 semester hours.

Prerequisite: SP 101-102 or equivalent.

For students with two years of high school Spanish or one year of college Spanish. Conversation, advanced study of grammar and composition. Works of prominent Spanish-American authors will be read.

SP 301-302. Main Currents of Spanish Literature. Credit, 6 semester hours.

Prerequisites: SP 201-202 or equivalent.

Writings representative of significant currents in Spanish literature from the Middle Ages to the Twentieth Century. Opportunity to improve speaking and listening ability. Conducted in Spanish. Laboratory optional, but recommended.

History

Thomas Katsaros, Chairman

HS 111. Western Civilization I: to 1700. Credit, 3 semester hours.

Western Civilization from the ancient beginnings to mid-seventeenth century. The patterns of the social, cultural and political aspects of ancient, medieval, and early modern eras that have shaped the Western tradition.

HS 112. Western Civilization II: from 1700 to present. Credit, 3 semester hours.

Prerequisite: HS 111.

European history from the Enlightenment to the present. Emphasis on economic and social changes, political history, the expansion of Europe and its international effects. Nationalism, imperialism, and socialism stressed.

HS 131. History of the Black Man in America. Credit, 3 semester hours.

A comprehensive study of the Negro in the United States, including African antecedents and an account of slavery, Emancipation and its aftermath, and Negro contributions to the Modern era.

HS 211. American History to 1865. Credit, 3 semester hours.

The development of the American nation from colonial times to 1865. Significant economic, social, political, and institutional developments.

HS 212. American History from 1865. Credit, 3 semester hours.

United States history from the Reconstruction through the contemporary era. Expanding industrialism, the changing concepts of the role of government, and the United States in world affairs.

HS 221. Comparative European Political Systems. Credit, 3 semester hours.

Prerequisites: HS 111-112.

Historical comparative approach to the political institutions of the United Kingdom, U.S.S.R., Federal Republic of Germany, and France. Emphasis on the relationship between Western and Eastern political systems.

HS 223. U. S. Diplomatic History. Credit, 3 semester hours.

Prerequisites: HS 211 and HS 212.

The ideas, trends and actions of U. S. Diplomacy from the American Revolution to the Spanish-American War; from the emergence of the United States as a world power to the foreign policy of the Nuclear Age.

HS 231. Modern Asia. Credit, 3 semester hours.

The ideological and traditional socio-political-economic-diplomatic background of East, South and Southeast Asia, the area's development since the impact of the West in the 16th century and the responses to this impact.

HS 308. Social and Intellectual History of the United States. Credit, 3 semester hours.

Prerequisites: HS 211-212.

Leading ideas that have shaped important periods of American history. The colonial mind and spirit, the democratic upheaval, sectionalism—war—and reconstruction, the industrialization of the country, religion as it met the new age of science and economics, agrarian revolt, overseas possessions, the beginning of the end of isolation.

HS 310. The History of Modern England. Credit, 3 semester hours.

Prerequisites: HS 111-112.

British institutions and industrial life from 1688 to the present. Traces the movement of British society from its eighteenth-century aristocratic base through the Liberal experiment of the nineteenth- to twentieth-century collectivism; England's role in international affairs.

HS 311. American Colonial History. Credit, 3 semester hours.

Prerequisites: HS 211-212.

The European background for the discovery and colonization of the New World, and the history of the British colonies in North America until Independence. The transformation of transplanted institutions within the American environment.

HS 312. The U. S. in the Twentieth Century. Credit, 3 semester hours.

Prerequisites: HS 211-212.

Political history, social trends, and intellectual movements. Study of the expansion of the functions of government to meet modern complex problems arising from social and cultural trends and from the involvement of the United States in global politics.

HS 314. The History of Germany from 1648. Credit, 3 semester hours.

Prerequisites: HS 111-112.

From the Treaty of Westphalia to the unification of Germany, the imperial era, the two World Wars, and the rise and fall of National Socialism to the problems of divided Germany today.

HS 315. The History of Europe in the Nineteenth Century. Credit, 3 semester hours.

Prerequisites: HS 111-112.

The main political, economic, and intellectual trends in Europe in the period from 1815 to 1914. The effects of industrialism, liberalism, and socialism on European society and culture. In international affairs, the impact of nationalism on European power politics and the failure of the major powers to resolve their differences in the Balkans.

HS 317. Renaissance and Reformation. Credit, 3 semester hours.

Prerequisites: HS 111-112.

Economic, political, intellectual, and religious developments in Continental Europe from 1300 to 1650; intellectual and social change during the transition from medieval to modern times; dynastic conflicts within the emerging state system.

HS 321. The History of Ancient Greece and Rome. Credit, 3 semester hours.

Prerequisites: HS 111-112.

From the Homeric period to the year 500 A.D. Events, institutions, and ideas that have shaped the Western tradition. The political, social, economic, and cultural problems that caused the decline of these civilizations.

HS 330. History of Russia. Credit, 3 semester hours.

Prerequisites: HS 111-112.

From the thirteenth century, with particular emphasis on the transition from an agrarian to an industrial society in the period since the emancipation of the serfs in 1861. The role of the U.S.S.R. in world affairs since the Revolution of 1917; its impact upon Asia and the West.

HS 401. Europe in the Twentieth Century. Credit, 3 semester hours.

The history of Western and Central Europe since World War I viewed from the perspective of Europe's rapidly changing role in world history. Europe's political, social, and economic adjustment to the Russian Revolution and Nazism, the emergence of America and Russia as super-powers, and the loss of overseas possessions.

HS 406. Modern Japanese History. Credit, 3 semester hours.

The institutional and cultural traditions of Japan, the nature of Japan's feudal society after 1600, and the interplay of indigenous and foreign elements in the changes which affected thought, politics, and society. After the coming of Perry, the adoption and reflection of parliamentary government and the reforms that followed World War II.

HS 407. Colonial and Early Latin America. Credit, 3 semester hours.

Prerequisites: HS 111-112, 211-212.

European and Indian origins, the formation of a colonial society and culture in the sixteenth and seventeenth centuries, the background and course of anti-colonial upheaval in the early nineteenth century, the problems from the post-independence period to 1890.

HS 408. The History of Modern Latin America. Credit, 3 semester hours.

Prerequisites: HS 111-112, 211-212.

Latin America since 1890, including the distinctive histories of the major nations of Mexico, Brazil, Argentina, and Chile as well as the characteristics, problems, and prospects of the area as a whole. Inter-American relations and current revolutionary movements.

HS 409. Modern Chinese History. Credit, 3 semester hours.

The traditional society as it existed prior to the Opium War, China's confrontation with the West and its effect on political, intellectual, and economic developments. The formation and evolution of the present Chinese regime.

HS 410. A History of the Middle East. Credit, 3 semester hours.

The rise and spread of Islam and the development of an Arabic civilization. Primary attention on Turkey, Egypt, and Iran, the problems created by the Western impact on the peoples and governments of the area, the effect of the Zionist movement on Middle East politics.

HS 413. A History of Africa in Modern Times. Credit, 3 semester hours.

Morocco, Algeria, Tunisia and Libya, stressing the institutional histories of these countries, which enabled them ultimately to expel European imperialism. The second part of the course deals with nineteenth-century Africa, the partition of Sub-Sahara Africa by the European powers, the period of colonial domination, and the emergence of the independent states after 1945.

HS 415. Historiography. Credit, 3 semester hours.

The development of schools of historical thought and interpretation from Thucydides to Toynbee.

HS 416. Senior Seminar. Credit, 3 semester hours.

Prerequisite: 33 semester hours in History.

Required of all liberal arts students majoring in History, in the last semester of their senior year. The undertaking of an independent study and research project presented in an oral and written form.

Industrial Engineering

Francis J. Costello, Chairman

IE 102. Introduction to the Computer. Credit, 3 semester hours.

Prerequisites: M 002 or equivalent.

A first level course in computers for engineering and science students. An understanding of the interfacing of man, language, and computers is developed through Boolean algebra, logic theory, and soft hardware analysis. The student learns to write and debug FORTRAN IV programs via the campus computer.

Laboratory Fee: $3.00

IE 105. Technical Data Processing. Credit, 3 semester hours.

Prerequisite: M 002 or equivalent.

A first level course in computers for business, art, and social science students. An understanding is developed of the problems of interrelating the man, computer, and business systems with a data processing approach. The student learns to write and debug FORTRAN IV programs via the campus computer.

Laboratory Fee: $3.00

IE 119. Industrial Safety and Hygiene. Credit, 3 semester hours.

Prerequisite: IE 114, IE 214 or BA 125.

This is a basic course in industrial accident prevention and industrial hygiene, and covers: managerial accident prevention functions and responsibilities; injury data development, usage, and validity; machine guarding techniques and guard development, including point-of-operation drives; personal protective equipment; fire prevention and control, including flammable solvents, dusts and their characteristics; electrical hazards; hand tools, power and manual; employee training; communications; hazard analysis; accident investigation. Industrial hygiene problems caused by solvents, dusts, noise, radiation are studied, as well as regulatory bodies, laws, and catastrophe hazards.

IE 204. Engineering Economics. Credit, 3 semester hours.

Prerequisite: M 116 or M 117.

A quantitative analysis of applied economics in engineering practice; the economy study for comparing alternatives; interest formulae; quantitative methods of comparing alternatives; intangible considerations; selection and replacement economy for machines and structures; break-even and minimum cost points; depreciation; relationship of accounting to the economy study; review of current industrial practices. Promotes logical decisions through the consideration of alternative courses of action.

IE 214. Management Theory. Credit, 3 semester hours.

Prerequisite: Junior or Senior Status.

Provides insight into the elements of the managerial process and develops a rational synthesis of the mass of detail comprising the subject matter of management. Focusing largely upon the complex problems of top and middle-level management, this course investigates what managers do under given circumstances, yet stresses the on-going activities of management as part of an integrated, continuous process.

IE 223. Personnel Administration. Credit, 3 semester hours.

Prerequisite: IE 114, IE 214 or BA 125.

Provides a foundation in fundamental concepts and a general knowledge of techniques in the administration of personnel relations. The nature of personnel administration, the handling of personnel problems, employee attitudes and morale. Techniques of personnel administration: recruitment, interviews, placement, training, employee rating, as well as wage policies and administration. In order to secure breadth and depth in the approach to personnel problems, simple case studies are used at appropriate points throughout the course.

IE 224. Programming. Credit, 3 semester hours.

Prerequisites: IE 102 or IE 105; and M 115.

Introduces the student to computer programming, starting with the preparation of block diagrams, program coding, program compiling, and debugging. At least two different programming languages are learned and actual jobs programmed. The programs, written by the students, are then tested and debugged on a computer.

Laboratory Fee: $8.00.

IE 233. Cost Control. Credit, 3 semester hours.

Prerequisites: A 112 or A 113; M 115.

Basic analysis of cost control techniques. Designed to give members of the management team the underlying rudiments of cost control systems they will be using and by which they will be measured and controlled. Theory of standard costs, flexible budgeting, and overhead handling techniques emphasized by analytical problem solution.

IE 234. Production Control. Credit, 3 semester hours.

Prerequisites: IE 114, IE 214 or BA 125; and M 115.

The basic principles that govern production control in an industrial plant. These principles are worked out in the problems of procuring and controlling materials, in planning, routing, scheduling, and dispatching. Familiarizes the student with present and new methods used in this field, including O. R. techniques.

IE 243. Work Analysis. Credit, 3 semester hours.

Prerequisite: M 115.

An introductory course in Motion Analysis, Methods Analysis, and Work Measurement. Motion and Methods Analysis techniques include the Principles of Motion Economy, Process Analysis charting, Operations Analysis, Activity Analysis, and Work Design Layout Analysis. Students are required to design a work place project which will be filmed on CCTV for analysis.

Work measurement includes an introduction to Time Study fundamentals and Pre-Determined Time Systems.

IE 330. Industrial Automation. Credit, 3 semester hours.

Prerequisites: IE 102, EE 224, ME 204.

Develops the fundamental principles of automation, what automation is and how it is implemented in typical mechanical and processing industries. Topics covered include: single loop design, high traffic design, and competitive level design techniques. Tools for automation include: computers, feedback control, simulation, and digital and analog logic.

IE 344. Advanced Work Analysis. Credit, 3 semester hours.

Prerequisite: IE 243.

A course extending the principles introduced in the prerequisite course including the development of Standard Data Systems, formula construction in standard data, Methods-Time-Measurement and Master Standard Data predetermined time systems, Work Sampling, Standards on Indirect Work, Wage Payment Plans, and the use of Closed Circuit TV as a Methods training tool.

IE 346. Statistical Analysis. Credit, 3 semester hours.

Prerequisite: M 203.

Provides an introduction to the application of statistical techniques to industrial and engineering problems, probability and distribution theory, measures of central tendency and dispersion in relation to population and samples, as well as applications of algebraic methods in industrial practice, including advanced statistical methods.

IE 347. Probability Analysis. Credit, 3 semester hours.

Prerequisite: BA 216 or IE 346.

Develops the theory of probability and related applications. Introduces such relevant areas as: combinations and permutations, probability space, laws of large numbers, random variables, conditional probability, Bayes' Theory, Markov chains, and stochastic processes.

IE 402. Numerical Controls and Methods. Credit, 3 semester hours.

Prerequisites: IE 102, ME 124, M 204.

Involves the development and evaluation of methods for computing required numerical results from given numerical data specifically oriented toward numerical controlled machines.

IE 436. Quality Control. Credit, 3 semester hours.

Prerequisite: IE 346.

Economics of quality control; modern methods used by industry to achieve quality of product; preventing defects; organizing for quality; locating chronic sources of trouble; coordinating specifications, manufacturing, and inspection; measuring process capability, using inspection data to regulate manufacturing processes; control charts; selection of modern sampling plans.

IE 443. Factory Planning. Credit, 3 semester hours.

Prerequisites: IE 243, IE 204.

Factors in plant location, design, and layout of equipment. The basic principles of obtaining information essential for carrying out such investigations. Survey of such practices as material handling, storage and storeroom maintenance, and use of service departments in modern factories.

IE 502. Operations Research (Engineering). Credit, 3 semester hours.

Prerequisite: BA 216 or IE 346.

The Operations Research area is oriented to various mathematical and near-mathematical methods for getting answers to certain kinds of business problems. Simulation including Monte Carlo, queuing, the Flood method for assigning jobs, the transportation method, and linear programming including the simplex method with both algebraic solution and tableaus. Course is designed for Engineering students.

IE 503. Operations Research (Business). Credit, 3 semester hours.

Prerequisite: BA 216 or IE 346.

Similar to IE 502, but oriented toward Business students, with emphasis on specific applications to business problems.

IE 504. Laboratory—Thesis. Credit, 3 or 4 semester hours.

Prerequisite: Senior I.E. status.

Advanced laboratory testing and special problems. The student works on problems of his own selection which have been outlined by him and have received approval. They may be in the form of a semester thesis or a series of original experiments.

IE 507. Systems Analysis (General). Credit, 3 semester hours.

Prerequisite: Junior status required.

Presents the analytical and conceptual techniques upon which systems analysis and development is based, and applications to non-business as well as business operations. Development of case studies and their applications independently oriented to the student's major area of interest.

IE 508. Systems Analysis (Business and Engineering). Credit, 3 semester hours.

Prerequisites: IE 114, IE 214 or BA 125 and M 115.

Presents the analytical and conceptual techniques upon which systems analysis and development is based, and applications to business and industrial fields. Development of case studies and their applications independently oriented to the student's major area of interest.

IE 510. Business Games. Credit, 3 semester hours.

Prerequisites: IE 114, IE 214 or BA 125; and BA 216 or IE 346.

The Business Games area gives the student the opportunity of correlating his entire course of study in a management simulation framework. These training games make use of simulation models that explore specific management areas in depth. Operations research techniques of scientific management are developed. The purposes of these games are as follows: (1) to serve as a framework for training sessions in basic management principles; (2) to serve as an introduction to the problem of manufacturing management; (3) to serve as a focal point for management development discussion of long-range planning and decision assisting tools; (4) to show the student the use of modern electronic computer methods.

Journalism

Sydney J. Goluboff, Coordinator

J 101. Journalism I. Credit, 3 semester hours.

A survey of journalism designed to acquaint students with the profession. The American newspaper as a social institution and a medium of communication. The reporting of public affairs and elementary editing.

J 102. Journalism II. Credit, 3 semester hours.

Prerequisite: J 101.

The basic principles of journalism and the organizational patterns of the mass media. The gathering of journalistic stories and the writing of general, simple, complex, and feature stories.

J 201. News Writing and Reporting. Credit, 3 semester hours.

Prerequisites: J 101, E 113.

The elements of news, the style and the structure of news stories, news gathering methods, copyreading and editing. Practical experience in reporting, writing, and editing.

J 301. Advanced Journalism and Feature Writing. Credit, 3 semester hours.

Prerequisite: J 201.

Theory of copyreading, editing, feature writing, headline writing, and reporting. Practical problems.

Law Enforcement

John R. Conway, Chairman

PA 103. Police Organization and Administration I. Credit, 3 semester hours.

A general study of police organization followed by a detailed study of police administration; includes coordination of all branches of a large police department. An evaluation of line, staff, and auxiliary functions and the interrelationship and interdependence of each. The utilization of planning, analysis, and operations units as administrative aids.

PA 104. Police Organization and Administration II. Credit, 3 semester hours.

Prerequisite: PA 103.

A detailed study of police organization and procedures within a police department and consideration of the principles of organization and methods adopted by progressive departments to insure effective service to the community.

PA 106. Police Supervision. Credit, 3 semester hours.

Prerequisite: PA 103.

Supervisory problems within a police organization and the equating of sound principles of human relations and supervisory techniques to effective police performance. Course includes such topics as discipline, leadership, motivation, conference leadership, instruction, and training as well as a discussion of other tools and devices available to the supervisor in achieving departmental aims and objectives.

PA 201. Introduction to Forensic Science. Credit, 3 semester hours.

Prerequisite: PA 215.

A classroom lecture-discussion session and a practical laboratory period. Forensic Science (Criminalistics): the observation, collection, positive identification, and preservation of physical, chemical, and biological evidence for court presentation. The connection between the evidence found at the crime scene and the identification, apprehension, and conviction of the criminal. Fingerprints, identification of hairs and fibers, chemicals, narcotics, blood, semen, glass, soil and wood. Imprint and impression taking, bullet comparison, document examination, and various photographic methods.

PA 215. Principles of Investigation. Credit, 3 semester hours.

An introduction to criminal investigation in the field. Conduct at the crime scene, interview and interrogation of witnesses and suspects, the use of informants and the techniques of surveillance. The special techniques employed in particular kinds of investigation as well as presentation of the police case in court.

PA 217-218. American Legal System I and II. Credit, 6 semester hours.

The process through which justice is administered. History of the American Legal System. The Constitution of the United States as it applies to police forces. Also, rules of evidence with attention given to judicial notice, presumptions, the nature of real and circumstantial evidence, burden of proof, province of court and jury, documentary evidence, hearsay evidence, confessions, and admissions of witnesses. Particular emphasis will be given to evidence in criminal cases, presumptions of the penal law, the status of illegally obtained evidence, wire tapping, character evidence, proof of other crimes, admission of memorandum book entries, dying declarations, and involuntary confessions.

PA 221. Juvenile Delinquency. Credit, 3 semester hours.

Prequisites: P 111 and SS 113.

A general orientation to the field of delinquency and crime, including all aspects of the social and personal matrix out of which these forms of social destructiveness arise. An attempt is made to build up some consistent theory of causation in order to develop a suitable method of handling these serious problems.

PA 303-304. Forensic Laboratory I and II. Credit, 6 semester hours.

Prerequisites: PA 201, SC 121-22, CH 105-106.

Greater attention given to specific topics and to laboratory testing and identification than in PA 201. In the classroom the laboratory or practical procedures are outlined and discussed. The laboratory work involves testing and identification of evidence, and more detailed procedures are undertaken than in PA 201. An example would be the casting of hairs and fibers for microscopic identification of material as containing a narcotic or blood.

Laboratory Fee: $15.00 per semester.

PA 305. Interviewing and Interrogation. Credit, 3 semester hours.

Prerequisites: P 111 and PA 215.

Theories, techniques and tactics used in interviewing witnesses and interrogating suspects of crimes. Instrumental aids used for the detection of deception are included.

PA 306. Document Examination. Credit, 3 semester hours.

Prerequisite: PA 201.

Handwriting analysis. Examination of suspected documents, forgeries, signatures and anonymous letters, writing materials such as pens, inks, papers. Aging problems. Handwriting identification. Typescript comparison and the determination of the type of machine. Erasure decipherment and restoration of handwriting and typescript.

PA 311. Criminology. Credit, 3 semester hours. (See SS 311.)

Prerequisites: P 111 and SS 113.

The nature and causation of crime. Approaches to the study of crime, its treatment and prevention. The sociology of criminal law and the nature of criminal behavior; theories and research.

PA 401. Police Problems Seminar. Credit, 3 semester hours.

Prerequisite: Junior or Senior status.

An analysis of major police problems from the viewpoint of both the administrator and the line operations officer. Seeks the integration of established scientific knowledge with practical police experience.

PA 402. Police-Community Relations. Credit, 3 semester hours.

Prerequisite: SS 113.

Designed to put the police and the community in a broad theoretical context. Sociological and environmental implications examined. Attention given to police practices which have caused much public hostility and which have isolated law enforcement from the rest of society.

PA 403. Seminar in Scientific Crime Detection. Credit, 3 semester hours.

Prerequisite: PA 201.

Discussion of problems and actual cases from the criminal investigation and forensic science points of view. Problems in techniques and tactics in crime detection will be discussed.

PA 404. Criminal Law. Credit, 3 semester hours.

Prerequisite: Junior or Senior Status (Law Enforcement officers excepted).

The scope, purpose, definition and classification of Criminal Law. Offenses against the person, against habitation and occupancy; offenses against property and other offenses. Responsibility in general, and limitations on criminal capacity and its modifying circumstances. Special defenses. The Connecticut Penal Code will also be discussed.

PA 501. Law Enforcement Internship. Credit, 3 semester hours.

Prerequisite: Senior standing and permission of the department chairman.

This program provides monitored field experience with selected federal, state, or local law enforcement agencies subject to academic guidance and review.

Mathematics

Bruce W. Tyndall, Chairman

M 001. Mathematics Review I. No credit. Meets 3 hours per week.

Required of both day and evening students who do not show sufficient understanding of mathematics fundamentals, as determined by entrance examinations. Natural numbers, integers, rationals and irrationals, properties and operations in each, construction and solution of mathematical models using simple equations, and percentages.

M 002. Mathematics Review II. No credit. Meets 3 hours per week.

Prerequisite: M 001 or equivalent.

Continuation of M 001 offered to both day and evening students who do not show sufficient preparation for the standard course in college mathematics. Exponents, polynomials, rational functions, systems of equations, graphs, complex numbers, and quadratic equations.

M 105. Introductory College Mathematics. Credit, 3 semester hours.

Prerequisite: M 002 or Instructor's consent

Cannot be taken for credit by mathematics, physical science or engineering majors.

Topics include number systems, functions, trigonometry, and an introduction to probability and statistics.

M 115. Mathematical Analysis I. Credit, 3 semester hours.

Prerequisite: Entrance examination or satisfactory completion of M 002.

Cannot be taken for credit by mathematics and physical science majors.

Designed to offer the foundation needed for the study of calculus. Polynomials, algebraic functions, elementary point geometry, plane analytic trigonometry, and properties of exponential functions.

M 116. Mathematical Analysis II. Credit, 3 semester hours.

Prerequisite: M 115.

Cannot be taken for credit by mathematics, physical science, or engineering majors.

An intuitive approach to topics in functions, analytic geometry, differential and integral calculus, and probability. Designed for an insight into, and appreciation of, the methods of analysis.

M 117. Calculus I. Credit, 3 semester hours.

Prerequisite: M 115 or entrance examination.

The first-year college course for majors in mathematics, science, and engineering; and the basic prerequisite for all advanced mathematics. Introduces differential and integral calculus of functions of one variable, along with plane analytic geometry.

M 117s. Calculus I. Credit, 6 semester hours.

Prerequisite: M 002 or entrance examination.

Meets six hours per week and includes topics from M 115.

M 118. Calculus II. Credit, 4 semester hours.

Prerequisite: M 117.

Continuation of first-year calculus, including methods of integration, the fundamental integration theorem, differentiation and integration of transcendental functions, and varied applications.

M 121-122. Algebraic Structures I and II. Credit, 6 semester hours.

Prerequisite: Entrance examination.

A first course in abstract algebra: sets, mappings, operations, relations, elementary logic, number systems, and abstract systems.

M 127. Finite Mathematics. Credit, 3 semester hours.

Prerequisite: M 002 or adviser's consent.

Cannot be taken for credit by mathematics, physical science or engineering majors.

Matrix theory, introduction to linear programming, probability and sets with applications in the social and management sciences.

M 137. Calculus Topics. Credit, 4 semester hours.

Prerequisite: Completion of 2 semesters of calculus at another school, but insufficient entrance examination score to start with M 203.

The theoretical material of the standard first year of calculus, including limits, chain rules, mean value theorems, and a discussion of the fundamental theorem of integral calculus. Upon successful completion, the student is qualified for M 203.

M 203. Calculus III. Credit, 4 semester hours.

Prerequisite: M 118.

The calculus of multiple variables, covering third dimensional topics in analytics, linear algebra, and vector analysis, plus partial differentiation, multiple integration, infinite series, and indeterminate forms.

M 204. Differential Equations. Credit, 4 semester hours.

Prerequisite: M 203.

The solution of ordinary differential equations, including the use of Laplace transforms. Existence of solutions, series solutions, matrix methods, non-linear equations, and varied applications.

M 301. Linear Analysis. Credit, 3 semester hours. Alternates Day and Evening.

Prerequisites: M 203 and M 204.

Vector spaces, infinite series, tensors, eigenvalue theory, transformations, unitary spaces, and an introduction to functional analysis.

M 303. Advanced Calculus I. Credit, 3 semester hours. (EE Emphasis)

Prerequisite: M 204.

Topics covered from infinite series include convergence, tests for convergence, integration and differentiation, asymptotic expansions, and an introduction to real analysis concepts. Topics in complex variables include elementary functions, Cauchy-Riemann equations, Cauchy integral theorem, calculus of residues, integration, and conformal mapping.

M 304. Advanced Calculus II. Credit, 3 semester hours. (EE Emphasis)

Prerequisite: M 303.

Applied mathematics, including study of the Gamma and Beta functions, Laplace transforms, Legendre polynomials, Bessel functions, product solutions of partial differential equations, and boundary value problems.

M 305. Series Solutions. Credit, 3 semester hours. Offered on demand.

Prerequisite: M 204 and Instructor's consent.

Considers series solutions of ordinary differential equations, including the hypergeometric type, Fourier analysis, introduction to perturbation methods, and successive approximation solutions of non-linear differential equations.

M 309. Advanced Differential Equations. Credit, 3 semester hours. Offered every other year.

Prerequisite: M 204.

Theoretical analysis and applications of nonlinear differential equations. Phase plane and space, perturbation theory and techniques, series and related methods, stability theory and techniques, and relaxation phenomena.

M 321-322. Modern Algebra I and II. Credit, 6 semester hours.

Prerequisites: M 122 and M 203.

Groups, rings, integral domains, fields, reals by Dedekind cuts, complex numbers, polynomials, vector spaces, linear transformations, and matrices.

M 325. Number Theory. Credit, 3 semester hours. Offered every other year.

Prerequisite: M 122 or M 118, and Instructor's consent.

Topics are selected from the following: mathematical induction, Euclidean algorithm, integers, number theoretic functions, Euler-Fermat theorems, congruence, quadratic residues, and Peano axioms.

M 331. Linear Algebra. Credit, 3 semester hours.

Prerequisite: M 203.

Linear spaces and systems, matrices, linear transformations and mapping, quadratic forms, spectral theory and decompositions, and an introduction to multilinear products.

M 338-339. Numerical Analysis I and II. Credit, 6 semester hours. Offered every other year.

Prerequisite: M 204.

Approximation and error evaluation. Finite differences, approximation by polynomial and orthogonal series, solutions of ordinary differential equations, solutions of elliptic, parabolic, and hyperbolic partial differential equations, interpolation, and basic integral equation solutions.

M 341. Sets and Ordered Structures. Credit, 3 semester hours. Offered every other year.

Prerequisite: M 331.

Axiomatic set theory based on the Zermelo-Fraenkel theory, algebra of sets, relations and functions, finite and infinite sets, order, axiom of choice and its equivalents.

M 343. Projective Geometry. Credit, 3 semester hours. Offered every other year.

Prerequisites: M 203 and M 331.

Projective transformations, fixed points, invariants, cross-ratio, conics, Euclidean and non-Euclidean geometrics.

M 345. Differential Geometry. Credit, 3 semester hours. Offered every other year.

Prerequisites: M 204 and M 331.

Basic techniques of applied analysis as illustrated with geometry. Tensors, curvature, surface theory, covariant differentiation, Green's & Stoke's type theorems.

M 371. Probability Theory. Credit, 3 semester hours. Alternates Day and Evening.

Prerequisite: M 203.

Axiomatic study of probability: sample spaces, combinatorial analysis, independence and dependence, random variables, distribution functions, moment generating functions, central limit theorem.

M 372. Mathematical Statistics. Credit, 3 semester hours. Offered every other year.

Prerequisites: M 204 plus IE 346 and/or one mathematics course beyond M 204.

Fundamental topics in random variables plus central limit theorem, distribution-free problems, analysis of variance, and an introduction to multivariate distributions.

M 411-412. Real Analysis I and II. Credit, 6 semester hours.

Prerequisites: M 303 and M 322.

Foundations of analysis; sets and functions, limits, operations on sequences, continuous functions on metric spaces, differentiation, Riemann-Stieltjes integral, integration theory, and an introduction to measure theory and the Lebesque integral.

M 423. Complex Variables. Credit, 3 semester hours. Offered every other year.

Prerequisite: M 303.

For mathematics, science, and engineering students.

Review of elementary functions and Euler forms; plus holomorphic functions, Laurent series, singularities, calculus of residues, contour integration, maximum modulus theorem, bilinear and inverse transformations, conformal mapping, and analytic continuation.

M 441. Topology. Credit, 3 semester hours. Offered every other year.

Prerequisite: M 341.

Topics selected from the following: Hausdorff neighborhood relations, derived, open and closed sets, closure, topological space, bases, homeomorphisms, relative topology, product spaces, separation axioms, metric spaces, connectedness and compactness.

Mechanical Engineering

Harry H. Steinhauser, Jr., Chairman

ME 101. Engineering Graphics. Credit, 3 semester hours.

An introduction to the principles and techniques of graphical communication. Fundamentals of orthographic projections; sections; applied geometry; auxiliary views; analysis of point, line, and plane relationships; detail and assembly drawings of simple machine parts.

ME 102. Engineering Drawing and Design. Credit, 3 semester hours.

Prerequisite: ME 101.

For technical students and draftsmen, covering layout of assembly drawings; detailing of their parts, properly dimensioned, for interchangeable manufacture; use of A S A tables of metal fits for machine parts; use of threads and fasteners with the use of tolerances and limits.

ME 124. Mechanical Processes. Credit, 3 semester hours.

Mill and manufacturing processes. The casting of metals, pattern making, and mold preparing. Fabricating, metal cutting, and welding. Demonstrations, laboratory, and inspection trips to local manufacturing plants.

ME 204. Dynamics. Credit, 3 semester hours.

Prerequisites: CE 201 and M 203 (M 203 may be taken concurrently).

Kinematics and dynamics of particles and rigid bodies with emphasis on two dimensional problems. Vector representation of motion in rectangular, polar, and natural coordinates. Impulse-momentum and work-energy theorems. Rigid bodies in translation, rotation and general plane motion.

ME 301. Thermodynamics I. Credit, 3 semester hours.

Prerequisites: PH 210 and M 203.

Classical thermodynamics treatment of first and second laws. Thermal and caloric equations of state. Closed and open systems, and steady flow processes. Absolute temperature, entropy, combined first and second laws. Introduction to statistical thermodynamics: particle distributions, statistical concept of entropy, and relation to macroscopic properties.

ME 302. Thermodynamics II. Credit, 3 semester hours.

Prerequisite: ME 301.

Extensions and applications of first and second laws: availability, combustion processes, phase and chemical equilibrium, ideal gas mixtures, Maxwell's relations. Steam power and refrigeration cycles. Internal combustion engine and gas turbine cycles. Irreversible thermodynamics.

ME 311. Machine Elements. Credit, 3 semester hours.

Prerequisite: CE 202.

Analysis and design of machine elements to meet specified operating conditions. Stresses, deformations and other factors in design of machine parts. Application to machine elements such as joints, shafts, gears, couplings, brakes, clutches, and flexible power-transmitting elements.

ME 312. Mechanical Design. Credit, 3 semester hours.

Prerequisite: CE 302.

Continuation of Machine Elements. Design projects selected individually and developed by the student.

ME 315. Mechanical Engineering Laboratory No. I. Credit, 2 semester hours.

Prerequisites: M 204 and ME 344 (ME 344 may be taken concurrently).

Students conduct selected tests in the fields of Mechanics of Materials and Vibrations. Emphasis placed on organization of the experiment, measurement techniques, sources of error and organization of the report. Students are required to design, conduct, and present one experiment of their own.

Note: Part-time students are charged for a standard 3 semester hour course.

ME 318. Advanced Materials Processing. Credit, 3 semester hours.

Prerequisites: ME 124 and CE 202.

Properties of materials. Forming, grinding, and cutting methods. Analysis of modern methods such as electrolytic grinding, high energy forming, and numerical control of machine tools.

ME 321. Fluid Mechanics. Credit, 3 semester hours.

Prerequisite: ME 204.

Fluid kinematics: continuity equation, vector operations. Momentum equation for frictionless flow: Bernoulli equation with applications. Irrotational flow: velocity potential, Laplace's equation, dynamic pressure and lift. Stream function for incompressible flows. Rotational flows: vorticity, circulation, lift and drag. Integral momentum analysis. Navier Stokes equation: stress tensor, Newtonian fluid. Boundary layer approximations.

ME 322. Introduction to Gas Dynamics. Credit, 3 semester hours.

Prerequisites: ME 321 and ME 302.

Compressible fluid flow with emphasis on one-dimensional ducted steady flows with heat transfer, frictional effects, shock waves and combined effects. Introductory considerations of two and three dimensional flows. Occasional demonstrations will accompany the lectures.

ME 335. Tool Design. Credit, 3 semester hours.

Prerequisites: ME 124 and CE 201.

Basic techniques of tool design, methods analysis, drill jig design, tolerances and allowances, cutting tools, die design, gauges, and fixtures.

ME 336. Tool Engineering. Credit, 3 semester hours.

Prerequisite: ME 335.

A continuation of ME 335 with emphasis on economics, estimating, and process planning. Student design projects requiring the complete planning and designing necessary to manufacture machine parts.

ME 343. Mechanisms. Credit, 3 semester hours.

Prerequisites: ME 204 and M 204.

Graphical and analytical methods for determining displacements, velocities, and accelerations of machine component. Application to simple mechanisms such as linkages, cams, and gear.

ME 344. Mechanics of Vibration. Credit, 3 semester hours.

Prerequisites: ME 204 and M 204.

The mathematical relationships necessary for the solution of problems involving the vibration of lumped and continuous systems; damping; free and forced motion; resonance; isolation; energy methods; balancing; single, two and multiple degrees of freedom; vibration measurement.

ME 401. Mechanical Systems Analysis. Credit, 3 semester hours.

Prerequisites: EE 224 and ME 344.

Dynamical systems and their characteristics. Analogy of electrical, mechanical, and other systems. Mixed systems—Dimensional Analysis—Design considerations.

ME 403. Introduction to Flight Propulsion. Credit, 3 semester hours.

Prerequisites: ME 322 and Instructor's consent.

A senior course designed for those students who intend to work or pursue further studies in the Aerospace field. Among the topics covered are: Detonation and deflagration, introductory one-dimensional non-steady gas flows, basic concepts of turbomachinery and a survey of the contemporary propulsive devices. Shock tubes, supersonic wind tunnel and flame propagation demonstrations will accompany the lectures.

ME 404. Heat and Mass Transfer. Credit, 3 semester hours.

Prerequisite: ME 321.

Conduction in solids, solution of multi-dimensional conduction problems, unsteady conduction, radiation, boundary layer and convection. Introduction to mass transfer. The lectures will include occasional demonstrations of convection, radiation, heat exchangers, etc.

ME 405. Advanced Mechanical Design. Credit, 3 semester hours.

Prerequisite: ME 312.

Selected and advanced topics related to the design of Machine Elements such as hydrodynamic theory of lubrication and principles of hydraulic machines with application to hydraulic couplings.

ME 408. Advanced Dynamics. Credit, 3 semester hours.

Prerequisite: ME 204, M 304 or Instructor's consent.

Plane and spatial motion of particles and rigid bodies, inertia tensor, relative motion, gyroscopes, central force motion, Lagrangian and Hamiltonian Methods.

ME 415. Mechanical Engineering Laboratory No. 2. Credit, 2 semester hours.

Prerequisite: Senior status.

A survey of experiments and laboratory investigations covering the area of Fluid Mechanics, Thermodynamics, Heat Transfer and Gas Dynamics. The students are expected to have the required background in the above-mentioned fields.

Note: Part-time students are charged for a standard 3 semester hour course.

ME 512. Senior Seminar. Credit, 3 semester hours.

Open to Seniors in Mechanical Engineering only.

An independent design, theoretical analysis, or laboratory investigation as chosen by the student and approved by the Chairman of the Department. The work is performed by the student with frequent critiques by the responsible faculty member.

Materials Engineering

Richard J. Greet, Coordinator

MT 123. Engineering Materials. Credit, 3 semester hours. **SPRING TERM**

The principal engineering materials of modern technology. Physical testing and the evaluation of tests; steels and non-ferrous alloys and their heat treatment; cement, concrete, wood, ceramics, and plastics. Gives engineers sufficient background in these materials to aid them in selecting and setting specifications. Laboratory sessions enable students to witness and perform mechanical tests, heat treatments, hardenability tests, and cold rolling and annealing operations.

MT 219. Physical Metallurgy I. Credit, 3 semester hours. **FALL TERM**

Prerequisites: CH 105 and PH 108.

Introduction to the relationships between atomic structure and macroscopic properties such as mechanical strength and ductility. Crystallography, phase equilibrium, evaluation of physical tests, and heat treatment are among topics considered.

MT 220. Physical Metallurgy II. Credit, 3 semester hours. **SPRING TERM**

Prerequisite: MT 219.

Further understanding of physical metallurgy with emphasis on crystallography, solidification, heat treatment, and precipitation hardening. Lecture supplemented by laboratory work.

MT 301. Welding Metallurgy. Credit, 3 semester hours. (Evening Division only during 1971-72.)

Prerequisite: MT 220.

Welding and brazing procedures for ferrous and non-ferrous alloys. Demonstrations and examinations of macro and microstructures of welded members. The following processes studied in detail: brazing, metal arc, inert atmosphere, atomic hydrogen, electron beam, laser, and resistance welding.

MT 302. Polymeric Materials. Credit, 3 semester hours. **SPRING TERM**

Prerequisite: MT 219.

Chemistry and physical properties of rubber and plastic materials. Crosslinking, viscoelasticity, glass-transition, and molding methods.

MT 304. Mechanical Behavior of Materials. Credit, 3 semester hours. **SPRING TERM**

Prerequisite: MT 219.

Detailed study of elastic and plastic deformation of materials at room temperature and elevated temperatures. Dislocation theory and microplasticity models.

MT 324. Nuclear Metallurgy. Credit, 3 semester hours. **FALL TERM**

Prerequisite: MT 219.

Nuclear reactors, production and fabrication of uranium metal and alloys, metallurgy of zirconium, thorium, plutonium, beryllium, liquid metals used in nuclear reactors, fabrication of reactor components, non-destructive materials testing, and the radiation damage of materials.

MT 331. Non-ferrous Metallurgy. Credit, 3 semester hours. **FALL TERM**

Prerequisite: MT 220.

The physical metallurgy of aluminum, magnesium, copper, nickel, zinc, lead, tin, and their alloys covered by lecture, discussion, and laboratory work. Melting, alloying, casting, extruding, rolling, drawing, and heat treating of the metals with emphasis on the effects of variables and reasons therefor. Typical mill and service difficulties analyzed in the light of the specific fundamental principles involved.

MT 342. Steels and Their Heat Treatment. Credit, 3 semester hours. **FALL TERM**

Prerequisite: MT 220.

Fundamentals of ferrous physical metallurgy such as the iron-carbon phase diagram, time-temperature-transformation diagrams, hardenability, and the effects of alloying elements. Heat treating discussed in terms of resulting microstructures and physical properties. Practical applications include engineering steels, tool steels, and stainless steels, as well as the requirements of deep drawing low carbon steel.

Music

John Collinson, Dean, Arts and Sciences

MU 101. Introduction to Music. Credit, 3 semester hours.

Some of the basic forms of music and styles of various composers. Music appreciation.

MU 102. The Problems of Music. Credit, 3 semester hours.

Musical aesthetics and its relationship to the composer and his works. The problem of music as an art form in the twentieth century. A continuation of MU 101.

MU 105-106. Chorus. Credit, 1-8 semester hours; maximum per semester, 1 credit.

Open to all students interested in group singing. Students with adequate scholastic standing may carry this course for credit in addition to a normal program. Two hours a week.

MU 131. Introduction to World Music. Credit, 3 semester hours.

Various non-Western musical styles, their cultures and aesthetics; music of the primitive cultures of the Americas and the advanced musics of the Near and Far East; emphasis on India, the Orient, Southeast Asia, and Indonesia.

Offered Fall semester only, in alternate years.

MU 132. Introduction to American Music. Credit, 3 semester hours.

Music of the North American continent from the Puritans to the present day; both European and non-European musical traditions, with emphasis on 20th-century development in and out of the concert hall.

Offered Spring semester only, in alternate years.

MU 150. Introduction to Music Theory. Credit, 3 semester hours.

A basic introduction to the fundamentals of music: physical and acoustical foundations; harmony and melody; modality, tonality, atonality; consonance, dissonance, tension; some introductory composition in choral and contrapuntal styles.

Offered Fall semester only, in alternate years.

MU 201. Music Analysis and History. Credit, 3 semester hours.

Prerequisite: Must have basic reading ability in musical notation.

The growth of Western music to 1850. Analysis of musical masterpieces on a technical and conceptual basis.

MU 202. The Development of Contemporary Music. Credit, 3 semester hours.

Prerequisite: Must have basic reading ability in musical notation.

A continuation of MU 201, from 1850 to the present day. The medium of music as a structural and an emotional tool. Analysis of contemporary theories and compositions.

Philosophy

John Collinson, Dean, Arts and Sciences

PHL 111. Introduction to Problems of Philosophy. Credit, 3 semester hours.

Man's place in the universe, how we discover truth, the nature of beauty and the good, the basis of moral choices, etc.

PHL 113. History of Philosophy through the Renaissance. Credit, 3 semester hours.

Chronological introduction to problems of philosophy. Pre-Socratics, Plato, Aristotle, Medieval and Renaissance philosophers.

PHL 114. History of Modern Philosophy. Credit, 3 semester hours.

Chronological introduction to problems of philosophy. Seventeenth Century to the present, including Descartes, Hume, Hegel, Nietzsche, and contemporary philosophers.

PHL 124. Logic and Scientific Method. Credit, 3 semester hours.

Introduces the student to deduction, warranted induction, and scientific description.

PHL 213. Contemporary Issues in Philosophy. Credit, 3-6 semester hours.

Content varies with the interest of the instructor and the students. Current philosophical thinking in such areas as natural science, social science, metaphysics, religion, aesthetics, theory of knowledge, language, existentialism, ethics, and positivism.

PHL 222. Ethics in a Changing Society. Credit, 3 semester hours.

Prerequisite: PHL 111 or 113.

The major ethical systems in the framework of contemporary society. Ethical norms which point to goals of life and their relation to the issues in science, business, the professions, and other human activities.

PHL 225. Symbolic Logic. Credit, 3 semester hours.

Prerequisite: PHL 124 or M 121.

Formal deductive systems, including the propositional calculus, the calculus of functions, independence of axioms, primitive symbols, interpretation, paradoxes, theory of types, Goedel's theorem.

PHL 240. Philosophy of Science. Credit, 3 semester hours.

Prerequisite: PHL 111.

A study of the nature of scientific method, the logic of scientific explanation and theory construction, philosophical problems of selected sciences, and questions peculiar to the social sciences.

PHL 250. Philosophy of Religion. Credit, 3 semester hours.

Prerequisite: PHL 111.

An examination of some philosophical notions used in religious discourse; meaning, truth, fact, being, logic, etc.

PHL 322. Analysis and Criticism of the Arts. Credit, 3 semester hours.

Prerequisite: At least 3 semester hours of Philosophy.

The language used to talk about works of art. Form, content, expression, values, the ontological status of the art object.

PHL 340. History and Philosophy of Education. Credit, 3 semester hours.

Prerequisite: 3 semester hours in Philosophy.

A chronological treatment of philosophical ideas that influence contemporary education; how these ideas affect the day-to-day work of the teacher.

Physical Education

Donald Wynschenk, Coordinator of Physical Education

PE 111-112. Physical Education (men). No credit, required for graduation.

Fundamentals and skills of carry-over sports such as tennis, golf, volleyball, paddleball, handball, bowling, skating, swimming, softball, badminton, and squash. Understanding and development of skills in spectator team sports such as basketball, soccer, touch football, and softball. Calisthenics and adaptive exercise program.

PE 113-114. Physical Education (women). No credit, required for graduation.

Fundamentals and skills of carry-over sports such as tennis, golf, handball, bowling, skating, swimming, softball, badminton, and squash. Understanding and development of skills in spectator team sports such as basketball, soccer, volleyball, and softball. Calisthenics and adaptive exercise.

PE 221-222. Personal Hygiene. No credit.

Required of all day freshmen who are exempt from PE 111-112 or PE 113-114 due to medical or physical reasons. Personal aspects of hygiene, the principles of healthful living. Mental health, venereal disease, reproduction and marriage, birth control, and the effects of drugs, alcohol and tobacco on human behavior and the value of systematic exercise.

Physics

Irwin S. Boak, Chairman

PH 103-104. General Physics. Credit, 6 semester hours.

Cannot be taken for credit by students majoring in chemistry, physics or engineering.

Basic concepts of classical and modern physics such as fundamental laws and phenomena of mechanics, electricity, magnetism, heat, and optics. Conservation principles, relativity and quantum theory, atomic, nuclear, and solid state physics, geophysics, astrophysics, biophysics, laser and lunar science.

PH 105-106. General Physics Laboratory. Credit, 2 semester hours.

May be elected concurrently with PH 103-104.

Laboratory Fee: $15.00 per semester.

PH 108. Physics I w/Lab. Credit, 3 semester hours.

Prerequisite: M 117 or Instructor's consent.

Fundamental concepts and mathematical exposition, including calculus, of mechanics, statics, kinematics, Newton's laws, work, energy, power, conservation of energy and momentum, rotational concepts, simple harmonic motion.

Laboratory Fee: $15.00.

PH 203. Techniques in Nuclear Physics. Credit, 2 semester hours.

Prerequisites: Two semesters of a laboratory science and Instructor's consent.

The instruments and methods of nuclear physics. Experiments may be completed in biology, chemistry, engineering or physics, according to the interest of the student.

PH 209. Physics II w/Lab. Credit, 3 semester hours.

Prerequisites: PH 108, M 118.

Fundamental concepts and mathematical exposition, including calculus, of electricity and magnetism, electrostatics, direct currents, magnetic effects of a current, electrical instruments, ballistic galvanometer, induced E.M.F., inductance and capacitance, simple harmonic motion, physical basis for A.C. circuits, bridge measurement, potentiometer measurements.

Laboratory Fee: $15.00

PH 210. Physics III w/Lab. Credit, 3 semester hours.

Prerequisites: PH 108 and M 118.

Fundamental radiation topics include heat, sound, light; simple harmonic motion, generation of mathematical wave forms, wave propagation, laser demonstration of optical principles, lens systems, theory of color, wave interference, gratings, prisms, filters, spectroscopy.

Laboratory Fee: $15.00.

PH 211. Physics IV. Credit, 3 semester hours.

Prerequisite: PH 210.

Modern physics fundamentals. Twentieth-century developments in physics. Special relativity, quantum theory of radiation, DeBroglie waves, the Bohr atom, elementary wave mechanics, the solid state, crystal structure, semiconductors, and lasers.

PH 301. Analytical Mechanics. Credit, 3 semester hours.

Prerequisites: M 204, PH 108, or Instructor's consent.

Intermediate analytical mechanics. Statics and dynamics of particles and rigid body with emphasis on the theory of motion under central forces and on the use of the generalized coordinates; introduction to an elementary Lagrangian and Hamiltonian formalism; small vibrations.

PH 315. Nuclear Physics. Credit, 3 semester hours.

Prerequisite: PH 211 or Instructor's consent.

Elementary nuclear physics. Nuclear structure, natural radioactivity, induced radioactivity, nuclear forces, and reactions, fission and fusion, reactors, and topics of special interest.

PH 340. Lasers. Credit, 2 semester hours.

Prerequisite: PH 210 or Instructor's consent.

Laser theory, construction and application to latest engineering and scientific uses.

PH 351-352. Intermediate Electricity and Magnetism. Credit, 6 semester hours.

Prerequisites: PH 209 and M 204.

Electric field, potential, Gausse Law, dipoles, poissions, and LaPlace equations, dialectric theory, steady magnetic fields, electromagnetic induction, magnetic properties of matter, Maxwell equations, L-C-R circuits, A.C. circuit analysis, vacuum tube and transistor circuit theory.

PH 361. .Modern Optics. Credit, 3 semester hours.

Prerequisite: PH 210.

Solid state spectroscopy from the point of view of the research physicist and chemist. Modern optical devices including television pick-up tubes, electro- and injection-luminescent devices, image amplifiers, lasers and holography, fiber-optics, opto-electronics for computers.

PH 371. Advanced Laboratory I. Credit, 2 semester hours.

Prerequisite: PH 209.

Application of electrical and magnetic theory to ballistic galvanometer, cathode ray oscilloscope, current balance, oscillators, amplifiers, transistor and vacuum tube circuits, design of laboratory measuring equipment. Two 3-hour laboratory periods weekly.

Laboratory Fee: $15.00.

PH 372. Advanced Laboratory II. Credit, 2 semester hours.

Prerequisite: PH 210.

Selected experiments in optics including lasers (construction and applications), interferometry and spectrometry.

Laboratory Fee: $15.00.

PH 373. Advanced Laboratory III. Credit, 2 semester hours.

Prerequisite: PH 211.

Selected experiments in atomic and nuclear physics including nuclear radiation and decay, quantization of charge and light energy, and nuclear magnetic resonance.

Laboratory Fee: $15.00.

PH 400. Statistical Mechanics. Credit, 3 semester hours.

Prerequisite: Instructor's consent.

An introductory course in classical and quantum statistical mechanics. The canonical ensemble; Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics and their applications; statistical interpretation of thermodynamics; transport processes.

PH 401. Atomic Physics. Credit, 3 semester hours.
Prerequisite: PH 211.

Structure and interactions of atomic systems including Schrodinger's equation, atomic bonding, scattering and mean free path, radiative transitions, and laser theory.

PH 404. Senior Project. Credit, 1-6 semester hours.

Open only to senior Physics Majors. Individual projects in experimental or theoretical physics to be carried out under direct supervision of a faculty advisor.

PH 406. Solid State Physics. Credit, 3 semester hours.
Prerequisite: PH 211.

Elementary principles of the electrical behavior of solids as applied to semiconductors, metallurgy, and magnetically activated solid state devices.

PH 451. Elementary Quantum Mechanics. Credit, 3 semester hours.
Prerequisite: PH 211 or Instructor's consent.

An elementary treatment of nonrelativistic quantum mechanics. Schrodinger's equation with its applications to atomic and nuclear structure; collision theory; radiation; introductory perturbation theory.

PH 452. Thermodynamics. Credit, 3 semester hours.
Prerequisites: PH 108 and Instructor's consent.

An introduction to thermodynamics and kinetic theory. Laws of thermodynamics, entropy, application to simple physical and chemical systems; thermodynamic inequalities and equilibrium; phase transitions; properties of ideal gases; low temperature physics.

PH 470. Theory of Relativity. Credit, 3 semester hours.
Prerequisite: Instructor's consent.

Introductory course on Einstein's theory of Relativity. Special theory of relativity including the Lorentz Transformation, Minkowsky geometry, relativistic mechanics and electromagetism. General theory of relativity including principle of equivalence, Einstein's theory of gravitation, graviton.

Political Science

Caroline A. Dinegar, Chairman

PS 110. Government and Politics of East Asia. Credit, 3 semester hours.

A comparative study of the traditional and modern political and social structures of China, Japan and Korea, the functioning of the political system within each country.

PS 120. Scope and Methods of Political Science. Credit, 3 semester hours.

A basic introduction to the discipline of Political Science for Political Science majors: the traditional approach to politics as well as the newer areas of the discipline concerning behavioralism, model building, and the role playing techniques. This course is also an introductory approach to the nature and value of inter-disciplinary studies.

PS 121. American Government. Credit, 3 semester hours.

An introduction to the American Federal System stressing the constitutional foundations, structures and functions of the national government, the electoral process, and interstate relationships.

PS 122. State and Local Government. Credit, 3 semester hours.

The philosophical foundations, structures, and functioning of local government in the United States. The impact of technology, change, and regionalism on the traditional governing process at the local level.

PS 216. Urban Government. Credit, 3 semester hours.

The organizational and administrative government at the municipal level with special emphasis upon the problems of modern urban America in relation to social and political development.

PS 221. International Relations. Credit, 3 semester hours.

Forces and structures operating at the international level in the modern nation state system: the foreign policy process and the decision-making process, the impact on traditional inter-state behavior of the decolonization process and the economic and political developments since World War II.

PS 223. International Law and Organization. Credit, 3 semester hours.

Prerequisite: PS 221.

The traditional as well as modern approach to international law and organization; major emphasis on the contribution of law and organization to the establishment of a world rule of law and world peace. The League of Nations system and the United Nations system are analyzed in depth.

PS 302. Constitutional Law. Credit, 3 semester hours.

Prerequisite: PS 121.

The principles and concepts of the United States Constitution as revealed in leading decisions of the Supreme Court through the process of judicial review.

PS 304. Political Parties. Credit, 3 semester hours.

Prerequisite: PS 121.

An historical and functional analysis of the American political party system, including a study of interest groups, public opinion, electoral behavior, political leadership and modern proposals for the reorganization of the existing party system.

PS 308. Legislative Process. Credit, 3 semester hours.

Prerequisite: PS 121.

The role of the legislature in modern American government: the relationship of the electors and the apportionment system to the law-making function, the concept of the veto power and the committee system within the limitation of constitutionalism.

PS 401. Political Theory, Ancient and Medieval. Credit, 3 semester hours.

Prerequisite: HS 111.

Western political thought from Plato to Sir Thomas More. Emphasis upon basic concepts and questions consistently raised by political theorists. Required for all Political Science majors.

PS 402. Political Theory, Modern and Contemporary. Credit, 3 semester hours.

Prerequisite: HS 112.

A continuation of PS 401, the theories of selected writers from Thomas Hobbes to the present. Required for all Political Science majors.

PS 416. Senior Seminar in Political Science. Credit, 3 semester hours.

Prerequisite: Permission of the department chairman.

This seminar consists of the construction and preparation of an individual research project in Political Science by the student and the presentation of that project in oral form within the seminar and in written form as the Seminar Thesis. This seminar is required of all Political Science majors.

Psychology

David Brown, Chairman

P 111. Psychology. Credit, 3 semester hours.

Important principles of human behavior. Motivation, emotion, learning, personality, intelligence, etc. The utilization of psychological knowledge in relation to everyday human activities.

P 212. Business and Industrial Psychology. Credit, 3 semester hours.
Prerequisite: P 111.

Psychological principles and research findings pertinent to administration in business and industry. Contemporary research of behavior factors in managerial contexts:

P 216. Developmental Psychology. Credit, 3 semester hours.
Prerequisite: P 111.

Processes of development of the child, adolescent and adult, motivation changes in interests, attitudes, and abilities, social and cultural influences.

P 301. Statistics for Behaviorol Sciences. Credit, 3 semester hours.
Prerequisite: 3 semester hours of mathematics at the college level.

Consideration of statistical concepts pertinent to the behavioral sciences. Application of statistical techniques to experimental design and research findings. Required of Psychology majors.

P 305. Research Design and Methods in Psychology I. Credit, 3 semester hours.
Prerequisites: P 111 and P 301.

Methods of design and analysis in psychological research. Consideration of psychophysical methods, general variables, design problems, problems of inference. Required of Psychology majors.

P 306. Research Design and Methods in Psychology II. Credit, 3 semester hours.
Prerequisite: P 305.

Methods of design and analysis in perception, learning, motivation, concept-formation, etc. Group and individual research projects.

P 315. Psychology of Learning. Credit, 3 semester hours.
Prerequisites: P 111 and P 216.

Psychological principles underlying learning and teaching. Learning theories and their application to behavioral change.

P 321. Social Psychology. Credit, 3 semester hours. (See SS 320.)
Prerequisites: P 111 and SS 113.

The interdependence of social organizations and behavior. The interrelationships between role systems and personality; attitude analysis, development and modification; group interaction analysis; social conformity; social class and human behavior.

P 336. Abnormal Psychology. Credit, 3 semester hours.
Prerequisite: P 111.

Psychological and organic factors involved in personality disorganization. The psychodynamics and classification of psychoses, neuroses, brain disorders, personality disorders, psychophysiological disorders, transient stress disorders, and mental retardation.

P 341. Psychological Theory I. Credit, 3 semester hours.
Prerequisites: P 305 and senior class status.

The historical background of contemporary issues in modern psychological schools.

P 342. Psychological Theory II. Credit, 3 semester hours.
Prerequisite: P 341.

Continuation of Psychological Theory I. Emphasis placed on contemporary problems of psychology in the light of twentieth century developments in theory.

P 350. Theory and Principles of Psychologicol Measurement. Credit, 3 semester hours.
Prerequisite: P 301.

The bases for constructing and evaluating standardized tests in psychological, educational and industrial applications.

P 361. Physiologicol Psychology. Credit, 3 semester hours.
Prerequisites: P 111 and SC 121-122.

Endocrinological, neural, sensory and response mechanisms involved in learning, motivation, adjustment, emotion, and sensation.

P 370. Psychology of Personality. Credit, 3 semester hours.

Prerequisites: P 216 and P 315.

Major personality theories and their implications for understanding both normal and deviant personality developments.

Public Administration

Jay M. Etlinger, Chairman

SA 211. Principles of Public Administration. Credit, 3 semester hours.

Prerequisites: PS 121 and PS 122 or PS 216.

The development, organization, functions, and problems of national, state, and local administration.

See Business Administration for further courses in the general area.

SA 390. Administrative Law. Credit, 3 semester hours.

Prerequisite: SA 211.

The basic legal arrangement of administrative organization; rules governing use and exercise of administrative powers; legal procedures for enforcement of bureaucratic responsibility.

SA 490. Principles and Practices of Public Health Administration. Credit, 3 semester hours.

Prerequisite: PA 390.

Administrative considerations in Public Health: an examination of the patterns of public health activities in the United States.

SA 491. Public Health Law. Credit, 3 semester hours.

Prerequisite: PA 390.

The role of law in Public Health. Enforcement and administration: legal tools and administrative technique of public health enforcement and administration.

Science and Biology

H. Fessenden Wright, Chairman

Upper level courses may be offered every second or third year.

SC 111-112. Physical Science. Credit, 6 semester hours.

Science and its relation to other areas of learning and to daily living. Development and unity of physical science as a field of knowledge. Subject material includes astronomy, physics, chemistry, and geology.

SC 121-122. Biology. Credit, 6 semester hours.

A survey of the members of the three biological kingdoms; the basic concepts of cellular structure and function. Comparison of the anatomy and physiology of representative members of the protist, the plant, and the animal kingdoms. Major emphasis placed on the human organism. Student introduced to each of the major subdivisions of biology.

SC 123. Human Biology. Credit, 3 semester hours.

Prerequisite: SC 121.

A condensed study of Human Anatomy and Physiology with some aspects of nutrition and disease included, and an introduction to Population Genetics and Physical Anthropology. Designed to replace SC 122 for those majoring in Psychology, Law Enforcement, and Sociology and Social Services. For laboratory credit, where needed, SC 132 may be taken concurrently or with permission after completing course work.

SC 131-132. Biology Laboratory. Credit, 2 semester hours.

The microscopic examination of cells and tissues and the dissection of various organisms from the earthworm to the fetal pig. Other experiments relate to classroom material.

Laboratory Fee: $15.00 per semester.

SC 135. Earth Science. Credit, 3 semester hours.

Those areas of science dealing with the earth and its environment. Includes elementary aspects of geology, oceanography, and meteorology.

SC 201. Genetics. Credit, 3 semester hours.

Prerequisites: SC 122, SC 251, or SC 252.

Mendelian genetics and developments that have produced the modern concept of inheritance; the role of DNA and theories of the chemical basis of heredity.

SC 202. Genetics Laboratory. Credit, 2 semester hours.

Prerequisite: SC 201.

Theory and techniques using flies, yeasts, bacteria, and viruses to illustrate the classical genetic theories. An introduction to biometrics is presented.

Laboratory Fee: $15.00.

SC 211-212. Human Anatomy and Physiology. Credit, 6 semester hours.

Prerequisites: SC 122 and SC 132 or SC 251.

The essentials of human anatomy and physiology. Systems studied one at a time, taking up the anatomical features first and then the physiological functions. Both normal and pathological conditions discussed whenever possible.

SC 213-214. Human Anatomy and Physiology Laboratory. Credit, 2 semester hours.

Prerequisites: SC 122 and SC 132 or SC 251.

For those who need laboratory and are taking SC 208 or SC 211-212. Examination of organs and organ stystems, using plastic models, slides of cells and tissues, human bones and dissection of preserved mammalian organs (cow's eye, sheep's brain). Transparancies and film loops used as supplemental material.

Laboratory Fee: $15.00 per semester.

SC 221. Human Ecology. Credit, 3 semester hours.

Prerequisites: SC 121-122.

Man's evolution and his impact on his environment. Human evolution, social and cultural behavior, attitudes toward the environment, pollution, resource depletion, economic factors of ecology, and overpopulation.

SC 222. Ecology. Credit, 3 semester hours.

Prerequisites: SC 122, SC 251 or SC 252.

The interaction of living things, with an emphasis on man, with each other and with their environment. Includes discussion of existence, food, reproduction, populations, migration, distribution, succession, rhythms, communities, adaptions and application.

SC 224. Field Ecology. Credit, 2 semester hours.

Prerequisites: SC 121-122 or SC 251-252; and SC 222, which may be taken concurrently.

One hour of class and one afternoon of laboratory in which basic ecological concepts will be demonstrated by the gathering and interpretation of field and laboratory data.

Laboratory Fee: $15.00.

SC 225. Evolution. Credit, 3 semester hours.

Prerequisite: SC 122.

Biochemical and organic evolution studied. Physical anthropology and paleontology introduced, and the relationship of evolution to genetics and ecology.

SC 227. Entomology w/Lab. Credit, 4 semester hours.

Prerequisites: SC 122 and SC 132 or SC 251.

Study of classification, evolution, anatomy, development, ecology, life-cycle, genetics, and systematics of insects, arachnoids, and myriapods. Consideration of insects as major competitors of man, as disease carriers and of their influences on history and culture. Examples of fundamental biological principles as related to insects are discussed. Insect culture, observation, and dissection are carried out in laboratory.

Laboratory Fee: $15.00.

SC 251. Zoology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 121 and SC 131 or Biology major.

The general morphology and phsysiology of animals from the amoeba to man, taken phylum by phylum. Dissection of representative animals from the major phyla, special emphasis on the Phyla Invertebrata.

Laboratory Fee: $15.00.

SC 252. Botany w/Lab. Credit, 4 semester hours.
Prerequisites: SC 121 and SC 131 or Biology major.

The comparative structure, function, habitat, and evolutionary relationships of plants, techniques of plant identification and classification. Field trips conducted when possible.

Laboratory Fee: $15.00.

SC 301. Microbiology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 121 and SC 131; or SC 251 or SC 252; CH 103.

A history of microbiology and a survey of microbial life. Bacteria as characteristic prototypes of all microorganisms; the environment, growth, reproduction, metabolism, and relationship to man of microorganisms.

Laboratory Fee: $15.00.

SC 302. Bacteriology w/Lab. Credit, 4 semester hours.
Prerequisite: SC 122 and SC 132; CH 103.

Theoretical and laboratory study of the morphology, physiology, and classification of bacteria and other microorganisms. The application of these facts to agriculture, industry, sanitation, public health and disease.

Laboratory Fee: $15.00.

SC 303. Histology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 121 and SC 131 or SC 251.

Microscopic and chemical structure of organs and tissues and their cell constituents. Microscopic observations, tissue staining and slide preparation.

Laboratory Fee: $15.00.

SC 304. Parasitology and Epidemiology w/lab. Credit, 4 semester hours.
Prerequisites: SC 251; SC 131 or SC 302.

Life history, physiology, morphology, reproductive cycle, and economic importance of most common parasites of plants and animals. This study is coupled with the spread and control of communicable and organic diseases.

Laboratory Fee: $15.00.

SC 306. Fresh Water and Marine Biology. Credit, 4 semester hours.
Prerequisites: SC 251, SC 252 and SC 222.

Aquatic organisms, their life-cycles, and their ecological factors. Causes of pollution when equilibria are upset.

Laboratory Fee: $15.00.

SC 307. Comparative Vertebrate Anatomy w/Lab. Credit, 4 semester hours.
Prerequisite: SC 251.

The structure, origin, and evolutionary history of the vertebrate organ systems. In the laboratory, representative species of each vertebrate class dissected, with attention given to the individual organ systems.

Laboratory Fee: $15.00.

SC 308. General Physiology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 251-252, CH 105-106, PH 103-104, PH 105-106

Basic theories of physiology as applied to plants and animals. Practical aspects and experimental techniques studied in the laboratory.

Laboratory Fee: $15.00.

SC 309. Plant Morphology and Taxonomy w/Lab. Credit, 4 semester hours.
Prerequisite: SC 252.

Comparative plant structure and reproduction, particularly as related to the classification of plants. Laboratory parallels the classroom, involving examination of microscopic slides, models, preserved specimens, and gross structures of dissected materials.

Laboratory Fee: $15.00.

SC 311. Phycology and Mycology w/Lab. Credit, 4 semester hours.

Prerequisites: SC 251 and SC 252.

Fresh-water and certain marine algae and the various types of fungi. Structure, physiology, life-cycles, reproduction, nutrition, ecology, their function as disease producers.

Laboratory Fee: $15.00.

SC 331. Animal Behavior. Credit, 3 semester hours.

Prerequisites: SC 122 and P 111.

Behavioral patterns of animals studied on a comparative basis. Laws and principles of ethology related to genetics, psychology, ecology, evolution, physiology, and social structure.

SC 361. Biochemistry I w/Lab. Credit, 4 semester hours.

Prerequisites: SC 122, SC 132, SC 251, and CH 106.

Functional groups of organic compounds, the physiological properties of these classes of compounds and the mechanism of their elimination from the system. The interaction and synthesis of these compounds will also be studied.

Laboratory Fee: $15.00.

SC 362. Biochemistry II w/Lab. Credit, 4 semester hours.

Prerequisites: SC 361 or CH 104-108 or CH 301-302; and SC 122, SC 132.

Amino acids, proteins, enzymes, coenzymes, vitamins, carbohydrates, nucleic acids, lipids, and certain alkaloids are discussed as to their chemical, physical and biological properties. Isolated enzyme reactions and the more important metabolic pathways are examined.

Laboratory Fee: $15.00.

SC 401. Embryology w/Lab. Credit, 4 semester hours.

Prerequisite: SC 251.

Origin and development of tissues, organs, and organ-systems during the embryonic and post-embryonic stages. In the laboratory the chick grown and studied at various stages.

Laboratory Fee: $15.00.

SC 402. Cytology w/Lab. Credit, 4 semester hours.

Prerequisite: SC 362.

Structure and basic concepts of cellular and tissue function on the molecular, sub-cellular and cellular level, problems and techniques of cellular biology. Tissue culture techniques in laboratory. The microscope and audio-visual equipment also employed.

Laboratory Fee: $15.00.

SC 403. Pothology w/Lab. Credit, 4 semester hours.

Prerequisites: SC 212, SC 251 and SC 301.

Causes, symptoms, progress, effect and control of diseases of animals, primarily man. Laboratory observation of diseased cells, tissues, and organs will be conducted partly at the University of New Haven and partly at St. Raphael's Hospital.

Laboratory Fee: $15.00.

SC 405. Neuro-endocrine Physiology. Credit, 3 semester hours.

Prerequisites: P 111; SC 123 or SC 212.

Morphology and physiology of the neurological and endocrine systems as related to the control of body functions. Relationship to behavior with examples from psychobilology and ethology.

SC 406. Food Science and Technology. Credit, 3 semester hours.

Prerequisites: SC 301-302; SC 361-362.

Man's food, its spoilage, preservation, and sanitation are presented. Food additives and the waste and pollution of the food industry are also studied.

SC 407. Characterization and Treatment of Wastes w/Lab. Credit, 4 semester hours.
Prerequisites: SC 135, SC 306, SC 361-362.

The types of waste materials generated by agriculture, industry, transportation, municipalities, and individuals are classified and the methods of their identification are studied. The various methods of treatment of each type of waste material is covered.

Laboratory Fee: $15.00.

SC 408. Water Quality Control and Pollution Ecology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 301 or SC 302; SC 306 and SC 407.

Recognition of the organisms of polluted waters and the selection of the most appropriate means of collection and analysis. Proper choice and use of analytical methods for determining water quality with the methods of analyzing the data. The most efficient methods to establish water purity of the desired quality and the ecology of polluted water containing various wastes.

Laboratory Fee: $15.00.

SC 410. General Environmental Health. Credit, 3 semester hours.
Prerequisites: SC 122 or SC 123; SC 301 or SC 302; and CH 106.

Communicable diseases and their spread and control; environmental factors affecting public health, applications of the principles of sanitation and health to the solution of environmental problems. Population trends and the collection and evaluation of statistics concerned with public health. Various aspects of preventative medicine.

SC 413. Air Pollutants w/Lab. Credit, 4 semester hours.
Prerequisites: CH 104-108; CH 201; SC 301 or SC 302; SC 361-362.

Physical, chemical, and biological properties and sources of the major air pollutants. New and older methods of sampling, identification, and measurement are presented.

Laboratory Fee: $15.00.

SC 414. Air Quality Control and Management w/Lab. Credit, 4 semester hours.
Prerequisites: SC 413 and CH 341 (can be taken concurrently).

Historical presentation and definition of air pollution problems. Approaches for abatement and preventation and the strategy to achieve objectives of air quality that meet regional standards.

Laboratory Fee: $15.00.

SC 415-416. Biophysics w/Lab. Credit, 8 semester hours.
Prerequisites: SC 308 and SC 362.

Principles and properties of large and small molecules in solutions, particularly in body fluids. Physical laws and theories relating to the action of the sense organs, nerves, muscles, and other physiological phenomena. Practical applications are studied or demonstrated in the laboratory.

Laboratory Fee:$15.00 per semester

SC 417-418. Bio-Techniques. Credit, 8 semester hours.
Prerequisites: Biology major and permission of instructor.

Clinical and research techniques used in the biological sciences. Advanced microscopy, photomicroscopy, cell and tissue culturation, clinical techniques and instrumental procedures.

Laboratory Fee:$15.00 per semester

SC 419. Pharmacology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 122 and SC 132; or SC 251-252; SC 362 or CH 302.

Science of medicinals and other chemicals and their effects produced by use and abuse on living organisms, the mechanisms whereby these effects are produced. Relation of structure to activity methods of assay, and metabolic pathways involved.

Laboratory Fee: $15.00.

SC 421. Toxicology w/Lab. Credit, 4 semester hours.
Prerequisites: SC 122 and SC 132, or SC 251-252; SC 362.

The action of chemicals, particularly poisons, on living organisms. Relation of structure to activity, mechanisms of detoxication (in vivo), and reason for activity studied. Methods of isolation, identification and characterization from tissues, toxic limits, methods of assay, types of antidotes used.

Laboratory Fee: $15.00.

SC 424. Psychobiology. Credit, 3 semester hours.

Prerequisites: P 111, SC 122 or 123, SC 132 and CH 106.

A study of the biological factors of behavior, with concepts drawn from numerous related disciplines, such as physiology, pharmacology, ethnology, ecology, anthropology, psychology, and biochemistry. One of the more recent advances in this field is that of the environmental impact on behavior patterns.

SC 461-462. Advanced Biochemistry. Credit, 6 semester hours.

Prerequisite: SC 362.

Enzymology and the more important metabolic pathways, including those of alkaloid synthesis.

SC 491-492. Seminar and Senior Thesis. Credit, 2 semester hours.

Prerequisites: Biology major and completion of Biology core requirements.

Hourly weekly meetings during which prepared papers are read by members of the class. Each student, with his adviser, must select a topic which from library sources is developed into a "Library Thesis." The contents of this thesis must be defended before department faculty members.

SC 495-496. Research and Independent Study. Credit, 2 to 8 semester hours.

Prerequisites: Biology major. By permission of the department.

Choice of a research topic, literature search, planning of experiments, experimentation, and correlation of results in a written report, under the guidance of a department faculty member.

Laboratory Fee: $15.00 per semester.

Sociology and Social Services

Faith H. Eikaas, Chairman

Peter T. Van Suetendael, Coordinator of Social Services

SS 113. Sociology. Credit, 3 semester hours.

The role of culture in society, the person, and personality; groups and group behavior; institutions; social interaction and social change.

SS 114. Problems in Sociology. Credit, 3 semester hours.

Prerequisite: SS 113.

The major problems which confront the present social order, and the methods now in practice or being considered for dealing with these problems.

SS 221. Cultural Anthropology. Credit, 3 semester hours.

A systematic survey of the customs of man found in preliterate societies as well as modern societies. A study of the evolution of culture and analyses of religion, economics, language, kinship, art, etc. as found in primitive and modern cultures.

SS 231. Juvenile Delinquency. Credit, 3 semester hours. (See PA 221.)

Prerequisites: SS 113 and P 111.

A general orientation to the field of delinquency and crime, including all aspects of the social and personal matrix from which these forms of social destructiveness arise. An attempt is made to build up some consistent theory of causation in order to develop a suitable method of handling these problems.

SS 301-302. Social Administration I and II. Credit, 6 semester hours.

Prerequisites: 3 hours in Sociology.

Welfare legislation, counseling in social administration, criminology, fields of social work, introduction to public welfare, introdutcion to case work, sociology of minority relations, child welfare problems, juvenile delinquency, group dynamics, methods of social research, introductory social statistics, sociology of the family, sociology of industry, population problems, problems of an aging population, problems of redevelopment, and urban renewal.

SS 311. Criminology. Credit, 3 semester hours. (See PA 311.)

Prerequisites: P 111 and SS 113.

The nature and causation of crime. Approaches to the study of crime, its treatment and prevention. The sociology of criminal law and the nature of criminal behavior; theories and research.

SS 312. Marriage-Family as a Sociological Institution. Credit, 3 semester hours.

Prerequisite: SS 113.

The structure and function of the family in American Society: analysis of social relations within the institution, factors contributing to its successful functioning, and those leading to alienation and social disorganization.

SS 320. Social Psychology. Credit, 3 semester hours. (See P 321.)

Prerequisites: P 111 and SS 113.

The interdependence of social organizations and behavior. The interrelationships between role systems and personality; attitude analysis, development and modification; group interaction analysis; social conformity; social class and human behavior.

SS 321. Social Stratification. Credit, 3 semester hours.

Prerequisite: SS 113.

Organization of social class: status, power and process of social mobility in contemporary society. Social stratification, its functions and dysfunctions, as it relates to the distribution of opportunity, privilege and power in an industrial society.

SS 331. Population Problems and Human Ecology. Credit, 3 semester hours.

Prerequisites: SS 113 and SS 221.

A sociological approach to social demography with attention given to population statistics found in U. S. Census reports and vital statistics reports. The quantitative patterns of distribution of population, and population changes and trends.

SS 400. Minority Group Relations. Credit, 3 semester hours.

Prerequisites: SS 113 and PA 218.

An interdisciplinary survey of minority groups in this country with particular attention paid to those ethnic, religious, and racial factors that influence interaction. Designed to promote an understanding of sub-group cultures.

SS 410. Urban Sociology. Credit, 3 semester hours.

Prerequisite: SS 113.

The problems of the cities. Residential patterns together with the physical development of cities and redevelopment plans. An examination of groups of people and their environment and the relationship between the two.

SS 411. Industrial Relations. Credit, 3 semester hours. (See BA 231.)

Prerequisite: BA 125.

Human factors in the management function including union-management relations, history of human relations, individual and group productivity, the company, and the community.

SS 413. Foundations of Sociological Theory. Credit, 3 semester hours.

Prerequisites: SS 113 and 6 additional hours in Sociology.

An anlysis of the development of sociology in the nineteenth century with particular emphasis on the theories of Conte, Durkheim, Simmel, Weber, Marx, de Tocqueville, and others.

SS 420. Community Problems. Credit, 3 semester hours.

Prerequisites: Permission of Coordinator of Social Services.

The students in this course will have an opportunity to familiarize themselves with one or more agencies in the community. They will become acquainted with the problems in the community confronting the agencies and will be asked to determine ways of dealing with these problems. The seminar method will be used.

SS 430. Special Welfare Legislation, Past, Present and Future. Credit, 3 semester hours.
Prerequisites: SA 301 and SA 302.

The course traces the history of man's efforts to assist others from early times to the present. The effects of the past are pointed out in the present welfare system. Welfare laws both past and present are examined. The student is made aware of the resources available for assistance as well as the reasons for the existence of these resources.

SS 440. Undergraduate Seminar. Credit, 3 semester hours.
Prerequisite: 21 semester hours in Sociology.

Open to Sociology majors by special permission of the department chairman. A detailed examination of selected topics in the field of sociology and a critical analysis of pertinent theories with emphasis on modern social thought.

SS 501-502. Internship. Credit, 3 semester hours.

Registration only by permission of the Coordinator of Social Services.

A seminar for Social Services majors. The program is in conjunction with social agencies in the area. The student engages in actual field experience in the area of his major field of interest. Seminars in conjunction with this experience provide an opportunity for an understanding of group and individual dynamics.

SS 512. Research Seminar. Credit, 3 semester hours.
Prerequisites: P 301 or BA 216 Statistics.

The student develops and carries out an original research project in social science, reporting his procedure to the class.

Theater Arts

John Collinson, Coordinator

T 131-132. Introduction to the Theater. Credit, 6 semester hours.

Using the theater resources of the New Haven area, students will study topics such as playwriting, directing, acting, set design, dramatic criticism. Students must pay theater admissions.

T 141-142. World Drama and Theater. Credit, 6 semester hours.

Dramatic literature from classical times to the present, considered in its contemporary theatrical setting.

T 341-342. Acting and Directing. Credit, 6 semester hours.

Exercises in acting and directing, moving from the elementary to the complex. Emphasis on acting during the first semester and directing during the second. The student may participate in major workshop productions.

T 491-492. Theater Arts Seminar. Credit, 6 semester hours.

Prerequisites: T 131-132, T 141-142, T 341-342 or Instructor's consent.

Independent study in special areas of drama: theater history, dramatic literature, criticism, playwriting, directing, acting.

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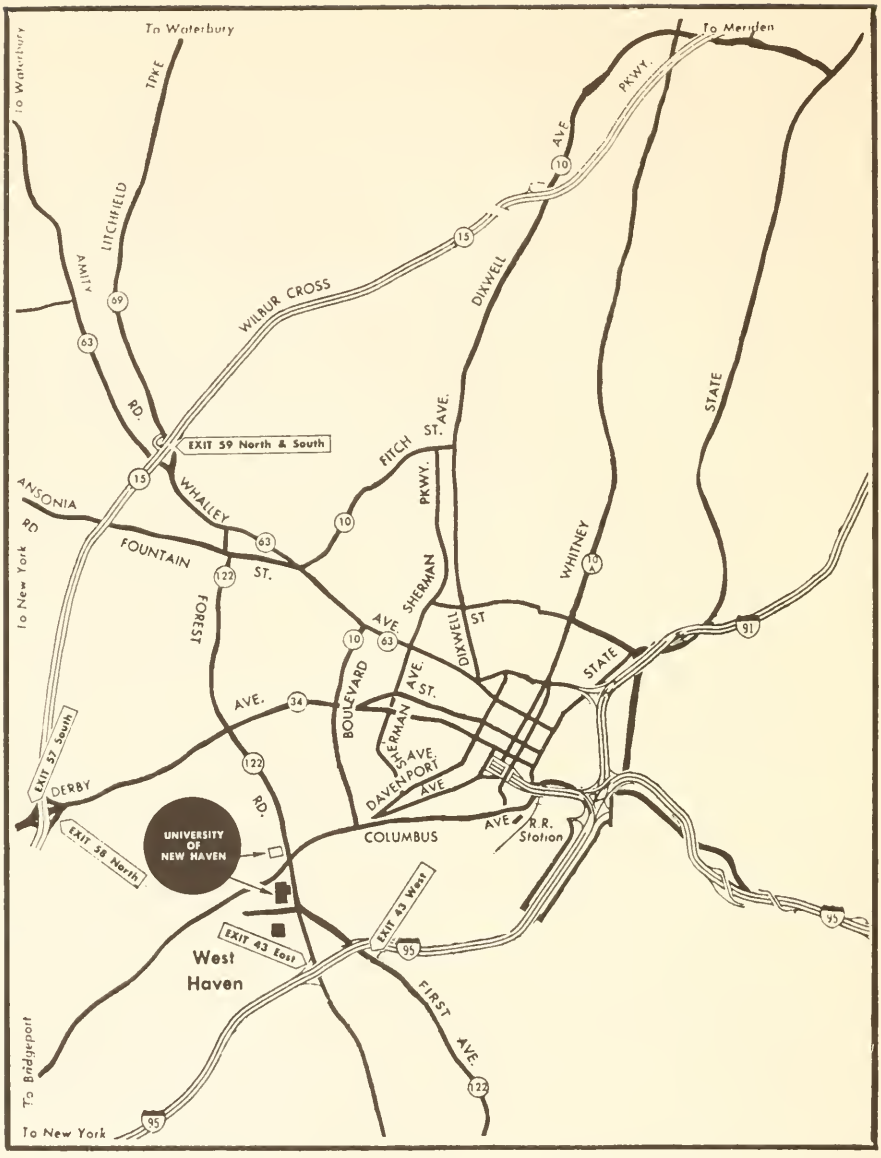
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